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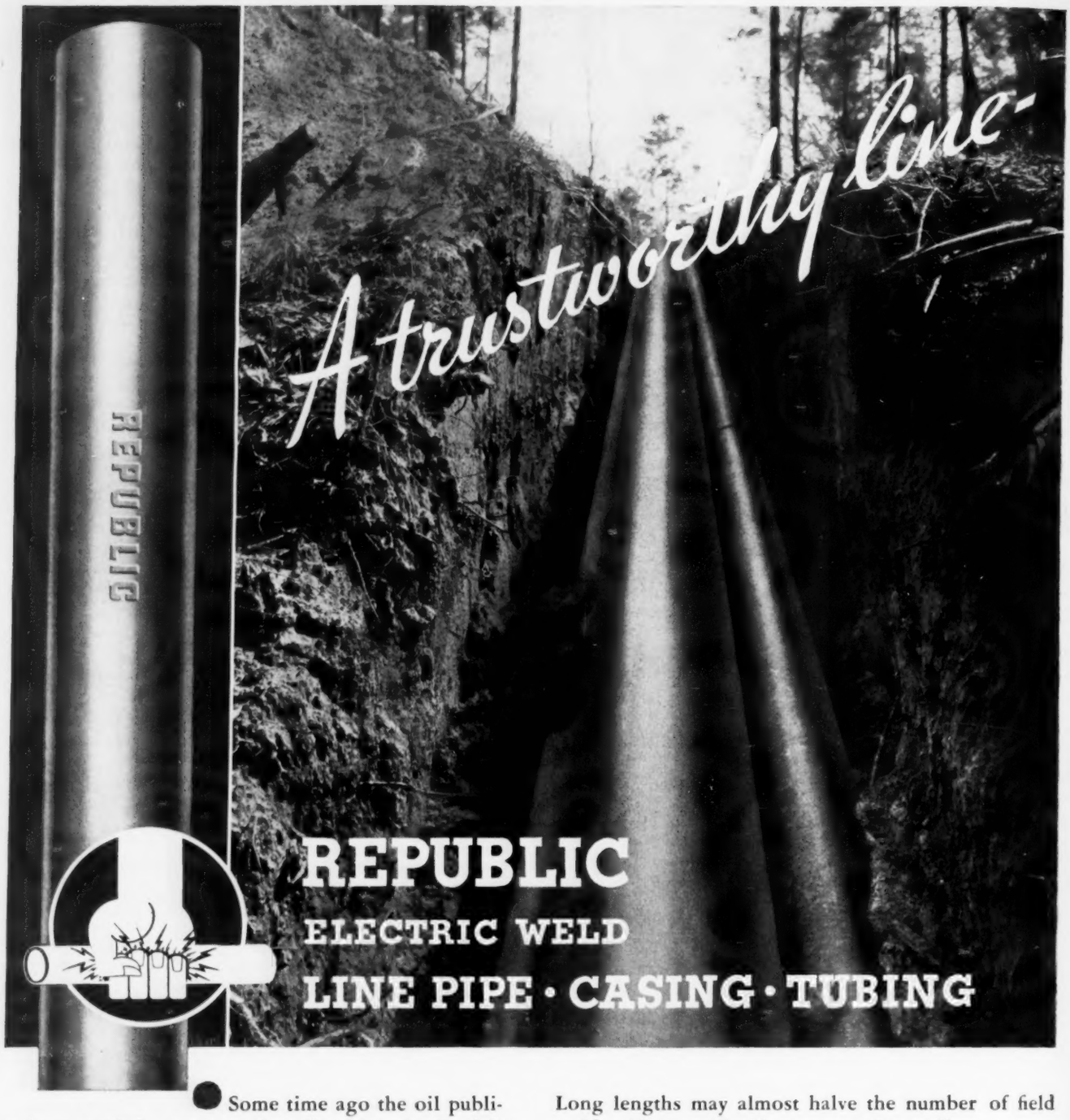


Some time ago the oil publications carried a note to the effect that the Fredell Construction Company, Denver, was installing for the Sinclair Pipe Line Co. 88 miles of 12-inch line from Troup to connect at College Station (Mexia), Texas, with the Pure Oil Pipe Line. No mention was made that the line was Republic Electric Weld Pipe, but it was, and it has proved a trustworthy line ever since it was placed in service.

The same qualities that built dependable performance into the earlier electric weld pipe are found in every length today. Straightness, uniform wall thickness, perfect roundness, freedom from scale inside and outside—all these are made possible by Republic's patented process of electric welding, which also insures a weld as strong as the wall itself. Uniform wall thickness and roundness mean easier field welding. Long lengths may almost halve the number of field welds. Absence of scale means a cleaner line.

Catalog 210-B tells the story of this better pipe, shows the results of many tests and contains data of value to every engineer interested in line design and construction. A copy will be sent without charge upon request.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES YOUNGSTOWN, OHIO

Volume 92 Number 13

STEEL

For forty-eight Years—IRON TRADE REVIEW

PRODUCTION • PROCESSING • DISTRIBUTION • USE

The Week in Perspective

TO THE thirsty and depression-weary beer may be only the ambrosia that cheers, but to iron and steel it means the renascence of an industry requiring plates for tanks and vats, chrome-nickel steel for tanks and barrels, tin plate for bottle crowns, strip steel for barrel hoops—in fact, castings and the entire gamut of steel products for machinery, piping, bottling equipment, delivery trucks and dispensing units (p. 11). The exact place of the revived brewing industry in the ranks of iron and steel consumers remains to be determined, but the impulse to demand at this time is promising. Most expectant are manufacturers of rust-resisting steel, a development during the 14 years of drought.

Railroad Pool May Affect Steel Needs

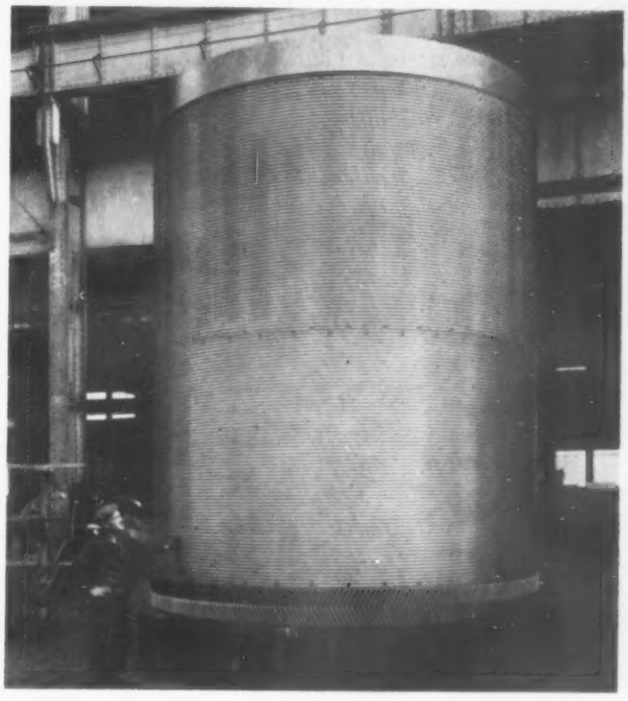
To President Roosevelt, however, beer is neither cheer nor tonnage but the third rung in his ladder of recovery, the first two being the bank adjustment and the economy program. Congress now is polishing off two more rungs—farm relief and emergency work—with a reorganization of the railroads (p. 16), of vital importance to steel, approaching. A vast transportation pool is a possibility. . . . A South American railroad solved one problem when it swapped (p. 16) corn for 17,000 tons of rails. . . . Though the American industry lost this business to the Spanish, February exports of iron and steel expanded 14 per cent, to 63,936 tons (p. 14), while imports declined 10 per cent to 19,748 tons. The balance of trade thus far in 1933 is more favorable than in 1932.

A Needed Trinity: Costing, Estimating, Pricing

Price assumes greater importance as recovery nears. . . . A so-called outsider, applying the stethoscope to iron and steel, detects (p. 13) alarming symptoms as the industry consumes its valuable raw materials and not only fails to break even but also makes an outright gift of $12 with every ton of ingots. . . . Gray Iron institute members, meeting at Cleveland, also view the price situation as crucial, stating (p. 14) that standardization of costing, estimating and pricing is essential. . . . Sheet mills, alert to this situation, are advancing prices (p. 44), galvanized going up $2 per ton April 5.

Market Foundations Now Going In

And steel is confident that recovery is under way, despite a reduction in operations to 14 per cent last week (p. 43). The market tone is subdued, following the buoyancy after



One of two lifting-hoist drums for Hoover dam cableway, to hoist 150 tons of supplies 600 feet from the river gorge to top of dam. Drums are 2-inch plates, 42 feet long, 8 feet wide, weigh 45 tons each, will wind over one mile of 1⅛-inch wire rope. General Electric arc welding machines and electrodes welded the seams and strengthened the internal structure

banks reopened, but the invisible, underlying shoring-up of confidence is unhindered. . . . Raw materials continue strongest, pig iron (p. 55) and scrap (p. 56) prices rising. . . . The London cable records (p. 59) mild but general improvement in the European markets, with prices firm. Japan continues an active buyer in world markets, taking plates on the Continent and scrap in the United States.

Even Dentures May Quit Gold Standard

Use of chromium steel instead of gold in dental bridges and plates was demonstrated (p. 27) at a recent dental clinic. At this time, the numerous advantages of steel over gold are neutralized by a cost which approximates that of gold, but a promised improved technique may prove the key to an attractive market. . . . For anchoring the wire cable of suspension bridges large numbers of sockets are employed. One manufacturer has been successful in forging sockets so closely to specified dimensions that only machining of pin holes and lead grooves is required (p. 27). Considerable attention has been directed to flow lines and working of the metal.

Heat the Handmaiden of Stamping

In the manufacture of steel stamped ware, heat is a vital factor. It is required in treatment of the metal, such as annealing between draws, heating for spinning, and burning off oil and dirt when fabrication is completed. It is also needed to take the surface finish applied in japanning, lithographing and enameling. Efficient gas-burning furnaces and appliances installed (p. 23) in the plant of a large metal stamped ware manufacturer thus employ heat. . . . Heat also is a strengthener of steel. When heat treated to a tensile of over 150,000 pounds per square inch, structural steel is lighter (p. 32) than duralumin.

Through the Week with the Engineer

Complete tests have now been made and announced (p. 23) on a new type of rivet-bolt fastening for field construction. . . . A process for coloring aluminum in 30 minutes is being marketed (p. 30). Aluminum is first given electrolytic treatment in bath to oxidize the surface, then placed in coloring solution. . . . Although open-hearth furnace roof ends and monkey walls conform to two general styles of contour, according to the fuel used, the contour and profile of the furnace interior is usually developed (p. 28) from judgment and artistry rather than from analytic technology. . . . A new iron, 99.93 per cent pure and intended for use where a soft, practically gas-free material is required, is now available (p. 23). It is called Svea metal.

The VOICE of INDUSTRY

Communications appearing here do not necessarily reflect the opinion of STEEL *or of its editors.*

Wages of Government Workers Undeflated

To the Editor:

I refer to the interesting letter W. E. Johnson, dealing in part with the subject of railway wages, published in STEEL in the issue of Feb. 27.

Railway wages are, in a way, in the same classification as the wages of government employes, because Congress through the Adamson law, has made it extremely difficult for the management of our railways to adjust wages; and the government, through the I. C. C., maintains a more or less effective control of our entire railway transportation system.

Before our government brought on the present trade depression, real wages of ordinary workers were standing still, or growing less, because of increasing hourly rates being paid to government employes. The depression has not seriously interfered with this process. The wage reductions of government employes (including railway workers) made last year were less than the decrease which has taken place in the cost of living since 1929.

Taking Mr. Johnson's figures for the wages of railway workers, and employing the National Industrial Conference Board's index for the cost of living, the hourly wages of railway workers increased 20 per cent between 1929 and 1931.

On account of the increase in hourly wages of postal employes made in 1931, the present real wage of these workers is 20 per cent greater than it was in 1930, in spite of the reduction of 8 1/3 per cent made last year. The dollar wage of 87.5 cents per hour is the same, but real wages for postal employes have risen from 87.5 cents to $1.06 per hour.

In this latter connection I am enclosing a study, showing the changes which have taken place during the last few years in the wages of postal employes and farmers, as well as the purchase value of these wages when reduced to hourly rates:

Study of Government Employe and Farm Wages

	Wages					Purchase value
Occupation	Per year	Per month	Per week	Per day	Per hour	of hourly rate*
Letter carrier:						
1930.....	$2100.00	$175.00	$42.00	$7.00	87.5c	87.5c
1931.....	2100.00	175.00	42.00	7.64	95.5c	104.0c
1932.....	1925.00	160.41	38.50	7.00	87.5c	106.0c
Farm laborer:						
1930.....	.....	44.59	.....	2.16‡	27.0c	27.0c
Farm owner, inc. family:						
1928.....	665.00†	55.40	12.90	2.13	21.3c	20.0c
1930.....	425.00†	35.40	8.25	1.36	13.6c	13.6c

Notes: Letter carriers were allowed two weeks vacation with pay in 1930 and 1931. Since July 1, 1931, most post-offices have been completely closed from 1 p.m. Saturday to 8 a.m. Monday.

*Purchasing value of dollar based on National Industrial Conference board figures.

‡Source, U. S. department of agriculture.

†Estimated reward per family for labor and management, by U. S. department of agriculture.

Before the depression the farmers were suffering from the effects of these artificial wage rates, but it was inevitable that in the end we should all suffer as we are suffering now.

JEROME ROWLY GEORGE

Beverly Hills, Calif.

BEER—What Will It Mean for Steel?

STAINLESS steel is an ideal material for use in the construction of brew kettles such as the one shown, of 10-000-gallon capacity. Photo taken in plant of Pilsener Brewing Co.

REJUVENATING an industry which at its peak in 1914 was capitalized at $858,861,000 and included 1392 operating plants—since shrunk to 231—is going to mean immediate opportunities for producers and fabricators of a wide range of materials and equipment, chief among which are companies engaged in the production and fabrication of iron and steel.

Reference, of course, is made to the brewing industry, recently accorded congressional sanction to resume the manufacture of beer containing 3.2 per cent alcohol by weight, or 4.0 per cent by volume, adjudged nonintoxicating.

Now nearly two decades from its one-time heyday, the brewing industry is prepared at once to throw its entire reserves into the breach with the aim of attaining within two years an annual production of 40,-000,000 barrels of 31 gallons each—about two thirds the 66,000,000 barrels brewed in 1914.

Estimated expenditures for brewery rehabilitation in the next year total $360,000,000—to buy machinery, equipment, buildings, refrigeration, malt and cereals, new beer cases, new bottles, automobile trucks, cooperage, advertising, etc.

Sensing the timeliness and importance of this huge market to the iron and steel industry, STEEL has undertaken to assemble authoritative figures and comment which will suggest possibilities and indicate future developments along lines which will prove to be profitmaking opportunities.

In a recent interview, August A. Busch, president, Anheuser-Busch Inc., St. Louis, said:

"It will take $5,000,000 to equip us to make the same amount of beer we were making before prohibition. We will begin at once to spend that amount. We will at once put 2500 men at work in our plant. We must have millions of bottles, all new labels, corks, kegs, delivery trucks and other equipment. We will have to reorganize and build up a new distribution system. Within a year we will have 25,000 new men at work in distributing our products. Our payroll will exceed $10,000,000 a year and we will be making 1,600,000 barrels of beer a year."

This is the statement of one leading brewer; there are now in existence over 200 breweries of varying capacities. Add to their needs the requirements of the numerous new brewing plants which are now in process of financing, plus the supplies needed by all companies building equipment for breweries, and a faint conception can be gained of the inflationary spiral which the revival of this business will start on its way.

Before going into the technical side of the picture, it will be interesting to note partial statements offered in testimony before recent meetings of the House ways and means committee in its consideration of the Collier beer bill. A few of them:

Harry S. Calvert, the Pfaudler Co., Rochester, N. Y., (glass-lined steel tanks): "It becomes essential, due to the fact that this (brewery supply) business must be revived, for our company to make an investment

Light in weight, strong and durable, easy to clean and having no effect on the contents, stainless steel beer barrels are new to this country. View was taken in a German plant where this type of barrel is now practically standard

of $200,000 to $300,000 in plant and equipment. We have an evidence of the interest in the subject by reason of the fact that since election our company has made over $5,000,000 worth of quotations."

E. A. Srill, General Box Co., Chicago (bottle boxes): "In our opinion the period of peak production necessary to supply the breweries with their initial stock of boxes will be six months. During this period expenditures by our company will include $294,100 for strap iron, nails and hardware used in our product."

Railroads Will Benefit

Owen T. Cull, Chicago, Milwaukee, St. Paul & Pacific railroad: "I have made an estimate, in which I want to be very conservative, that the Milwaukee road will benefit immediately to the extent of from $2,000,000 to $2,500,000 yearly as a direct result of handling commodities for breweries. It is my conclusion that immediately the railroads should benefit from the amount of material for the use of breweries and those that supply breweries to the extent of a minimum of $50,000,000 a year. It is a really a $100,000,000 proposition for the railroads."

William Schuchardt, vice president and general manager, Barry-Wehmiller Machinery Co., St. Louis (brewery machinery): "Our plant before prohibition used approximately 1900 tons of steel, iron, zinc, brass, etc., per year for manufacturing, pasteurizing and bottle cleaning machinery used by the brewery industry. In view of the prospect of congress legalizing brewing and sale of beer, we have sold some equipment already and have outstanding quotations amounting to about $400,000."

Phil N. Rose, vice president, Alvey Ferguson Co., New York (conveying equipment): "Much of the existing conveying equipment in breweries will need overhauling and extensive repairs. There are in this country approximately a dozen outstanding nationally known conveyor companies, all of whom will be benefited by the resumption of the brewing industry."

Joseph Dilworth, representing the committee on industrial rehabilitation, Pittsburgh: "We have had reports from St. Louis, Milwaukee, Pittsburgh and New York on the question of expenditures following beer legislation, and in those four cities alone it is reported to us that the brewing interests are prepared to spend from $40,000,000 to $50,000,000 immediately for capital expenditures and that means for rehabilitation and modernization projects throughout those plants."

Edward Verdi, Hoboken, N. J., Associated Cooperage Industries (wood barrels): "Assuming output of 40,000,000 barrels of beer for a year, this would require 12,000,000 various size barrels, which, at four hoops to the barrel, would mean 108,000 tons of steel alone. At an average of 20 tons to the car, this represents 5400 carloads of freight in steel for the year.

"According to the Sharon Steel Hoop Co., Sharon, Pa., 3220 man-hours of labor, equivalent to 402½ days, is required to produce 100 tons of hoop steel; 108,000 tons, therefore, would provide 456,300 days of labor. Using 250 actual working days as constituting a year's steady employment in steel mills, 1825 men would be given steady employment for a year."

5000 Motor Trucks Needed

D. C. Fenner, Mack-International Motor Truck Corp., New York: "From 1905 to 1920, the breweries of America consumed approximately 10 per cent of the early motor truck production. We have no idea of looking upon the present situation with the same degree of optimism, but we will say that we believe about 5000 motor trucks will be required, entailing an expenditure of about $25,000,000 and the employment of about 30,000 men."

A. W. Berresford, National Electrical Manufacturers association, New York: "The possible sale of electrical products to breweries and distributors of their products will range between $35,000,000 and $55,000,000, and the electrical manufacturing industry vitally needs this business."

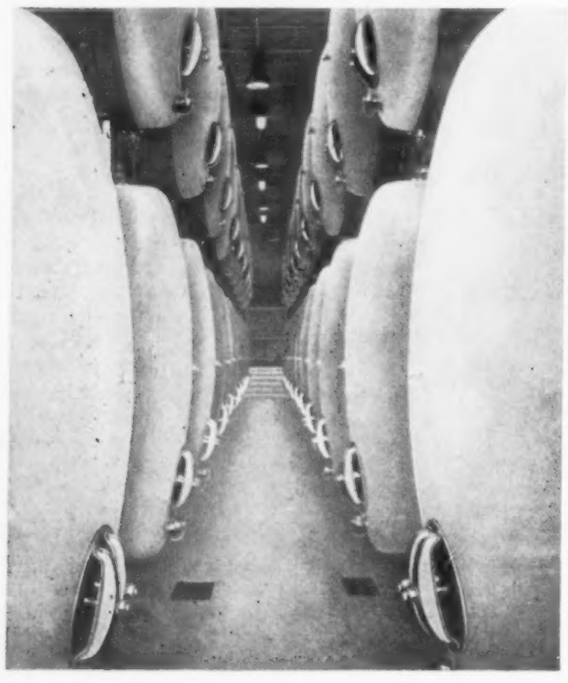
Charles H. Lipsett, New York, publisher: "The value of copper, brass, lead, steel and machinery used in the brewing industry runs into millions of dollars. Modification of the Volstead act releases several hundred million dollars worth of orders to the metal and steel working plants. Estimates indicate that each brewery contains 500 to 600 tons of iron and steel in the form of machinery, tanks, castings, etc., and 500 tons of structural steel in the building. Construction of 500 new establishments in the next year, as appears likely, would develop a market for 500,000 tons of iron and steel, of tremendous importance to the steel industry."

Louis B. Montfort, Washington, representing Crown Manufacturers Association of America (bottle caps): "Based on the estimate that 26,000,000 barrels of beer will be bottled in a year, this would require about 55,000,000 gross of crowns or caps. Such a production would require, in tin plate alone, 550,000 additional base boxes of 100 pounds each, which, at $4.25 per box would amount to about $2,337,000. I am advised by representatives of the tin plate industry

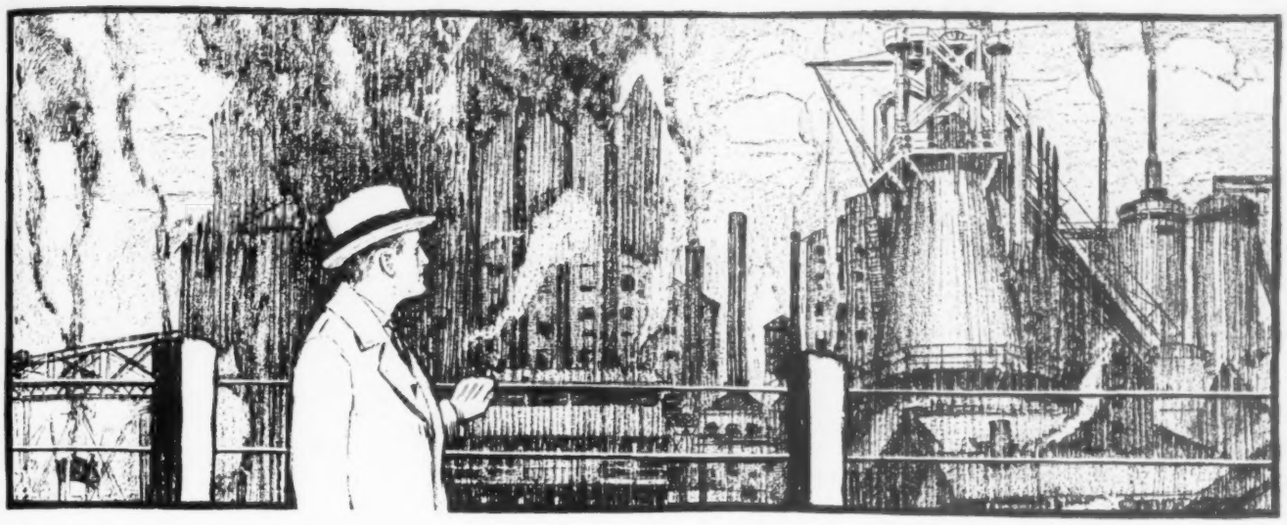
(*Please turn to Page* 24)

PRESIDENT ROOSEVELT on March 22 having signed the bill legalizing beer and light wines, the last barrier to revival of an important market for iron and steel is lowered. Obviously, the full possibilities of this market will appear only as actual manufacture proceeds, but the accompanying article by A. H. Allen, associate editor of STEEL, presents a preview.

STEEL invites manufacturers of brewery equipment and those entering this field to advise it of their products and materials employed in fabrication, looking to the publication of a complete list of such manufacturers and their products.



TYPICAL storage cellar in German brewery, with its long rows of tanks entirely of stainless steel. Photo is by courtesy of Crucible Steel Co. of America



An Outsider Looks at the Steel Business

For reasons of his own, the writer of this article has not signed his name. He is not connected with any steel company but he does come into rather frequent and intimate contact with it. Editorial comment on this article will be found on page 18.

—THE EDITORS

THERE is a Santa Claus! It is the big blustery steel business which made a present of $12.33 with every ton of steel it sold last year. Now, after three months of 1933, the beneficence continues, in spite of the fact that out of 20 major producing companies, representing 89 per cent of the industry's ingot capacity, only two showed a profit in 1932. What a big-hearted industry is steel!

These figures are nobody's secret. They appeared in the leading steel publication a few weeks ago. They showed that the loss in 1932 for these same 20 companies totaled $150,000,000—certainly a figure worth thinking about by anyone whose bread and butter is tied up with the industry.

Something has to be done. No industry can go on indefinitely showing such staggering losses. If it tries, the end is oblivion.

Too Much Emphasis on Price

Steel is acknowledged a vital factor in industry. In times of war its importance ranks with manpower and food. America without steel would be easy prey to any ambitious secondary power. In times of peace, steel loses its glamour and becomes something to be peddled from one office to another, and the lowest price or the man with the best liquor gets the business.

Users of steel laugh every time they place an order. Prices go down as competing manufacturers cut "just to keep the plant running," in spite of the fact that nothing is bought today except that which is absolutely necessary. Ore, coal and limestone are being used up at no profit to anybody except the ultimate buyer of steel, who today is getting too much for his money—and knows it.

So let's put the stethoscope on the industry.

We listen to the operating departments and this is what we find: Raw materials are plentiful and of high quality. Handling and transporting equipment is available that gives us ready-to-use costs as low as or lower than those of any other country. There is nothing wrong with our blast furnace equipment. Our open hearths are as efficient as present day materials can make them. Rolling equipment is being improved all the time. Certainly the mill equipment manufacturers have done their share toward helping the industry. And so we say this part of the giant is physically sound.

Move the stethoscope up a little higher. Place it on the merchandising artery. Those weak pulsations are sales efforts. Maybe we have located some of the trouble. Let's take a blood smear and look at it under the microscope. Those tiny cells are merchandising. Those big cells attacking the little ones are cut prices. A most unhealthy condition. The patient will have to be treated until this condition is reversed.

In other words, merchandising must be put ahead of price if the steel business is to recover from its own ills. Salesmen must sell the improved products of the industry on a basis of what they will be for the buyer. They must know their products, their competitors' products, how they can be used and worked, and be constantly alert to new uses. They must have mill and metallurgical knowledge and know how to apply it.

But the street-tramping salesman alone cannot do the job. The heads of the sales departments have been as much at fault as he—perhaps more so. In many cases they have educated him to think only in terms of price in their effort to turn in good tonnage, overlooking the fact that tonnage never made a dollar of profit unless the selling price exceeded the cost. Today, almost every sale of steel means a host of telegrams or telephone calls over expensive wires stretching between sales offices and the home sales department. "How much must we quote to get the order," is the time-honored query.

Executives Share Responsibility

And the responsibility goes back even farther, to the executive heads of the business—the financial heads who, with a few outstanding exceptions, are no more merchandising-minded than the lowliest salesman on the force.

These men know that profits are the life blood of business. They know that unless the plant runs on orders taken at the right prices they cannot make a profit. Yet these executives, too, are tonnage-minded and either mighty short-sighted or lacking in the courage of their conviction concerning their rights to protect the business that they control.

Here is a business that has shown in four years a decline in net return

(*Please turn to Page* 48)

Steel Exports Up in February, Imports Off, Continuing Gain of January

FOREIGN trade in steel and iron products in February showed a better balance for the United States, according to figures of the iron and steel division of the department of commerce.

Exports were 63,936 gross tons, the highest monthly total since April, 1932, and, with the exception of that month, since September, 1931. February exports were 58 per cent greater than those of February, 1932, and averaged 2283 tons daily, compared with 1830 tons in January, 1933.

Imports were 19,748 tons, the lowest for any month since July, 1932, and 26 per cent below those of January, 1933.

The gain of 7216 tons in exports was due largely to greater scrap exports. In individual commodities, gains and losses were equally divided. Scrap gained 6328 tons, seamless casing and oil line pipe 2528 tons, and wire rods 1324 tons. Japan was the leading export market, her total of 36,454 tons including 34,001 tons of scrap and 1971 tons of wire rods. Italy's total of 3583 tons was scrap, except 15 tons.

Pig iron was the largest item in imports, 8416 tons, of which 5496 tons came from the Netherlands and 2470 tons from British India. Belgium sent 1218 tons of the imports of 1812 tons of steel bars, 794 tons of the 1751 tons of hoops and bands and 1370 tons of 1597 tons of shapes.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1933		1932	
	Imports	Exports	Imports	Exports
Jan.	21,892	56,720	31,053	40,660
Feb.	19,748	63,936	26,738	40,492
2 mo.	41,640	120,656	57,791	81,132
March			41,031	49,927
April			36,339	58,118
May			39,751	80,477
June			34,494	52,081
July			18,005	52,558
Aug.			23,623	32,955
Sept.			29,241	36,038
Oct.			33,693	41,226
Nov.			34,924	56,041
Dec.			29,390	54,118
Total			378,282	594,691

ORIGIN OF FEBRUARY IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferro-manganese
Norway	7,115			20
Germany		34		20
Netherlands		5,496		
United Kingdom		150		57
Canada		207		756
Kwantung		59		
British India		2,470		
France				22
Total	7,115	8,416		875

	Steel ingots	Steel scrap	Steel bars	Cast iron pipe
Belgium	6		1,218	
Germany	6		155	
United Kingdom	11		39	
Sweden	30		58	
Canada		204	3	
Austria			3	
France			241	
Norway			87	
Czechoslovakia			8	
Total	53	204	1,812	

Standard Gray Iron Code Winning

UTILIZATION of the tentative specifications for gray iron, as adopted last June by the American Society for Testing Materials in furthering the merchandising campaign of the industry featured discussions at the annual meeting of the Gray Iron institute held in Cleveland, March 22.

Speakers stressed the importance of these specifications in the development of a certification plan for gray iron, and in establishing complete confidence in gray iron on the part of users of engineering materials.

A. E. Hageboeck, Frankite Corp., Moline, Ill., was re-elected president of the institute. J. H. Bruce, Bowler Foundry Co., Cleveland, was elevated from second vice president to first vice president and E. B. Sherwin, Chicago Hardware Foundry Co., North Chicago, Ill., was named second vice president.

R. D. Phelps, Francis & Nygren Foundry Co., Chicago, and H. C. Wilson, Cleveland Co-operative Stove

(*Please turn to Page* 52)

IMPORTS OF IRON AND STEEL PRODUCTS INTO THE UNITED STATES

Gross Tons

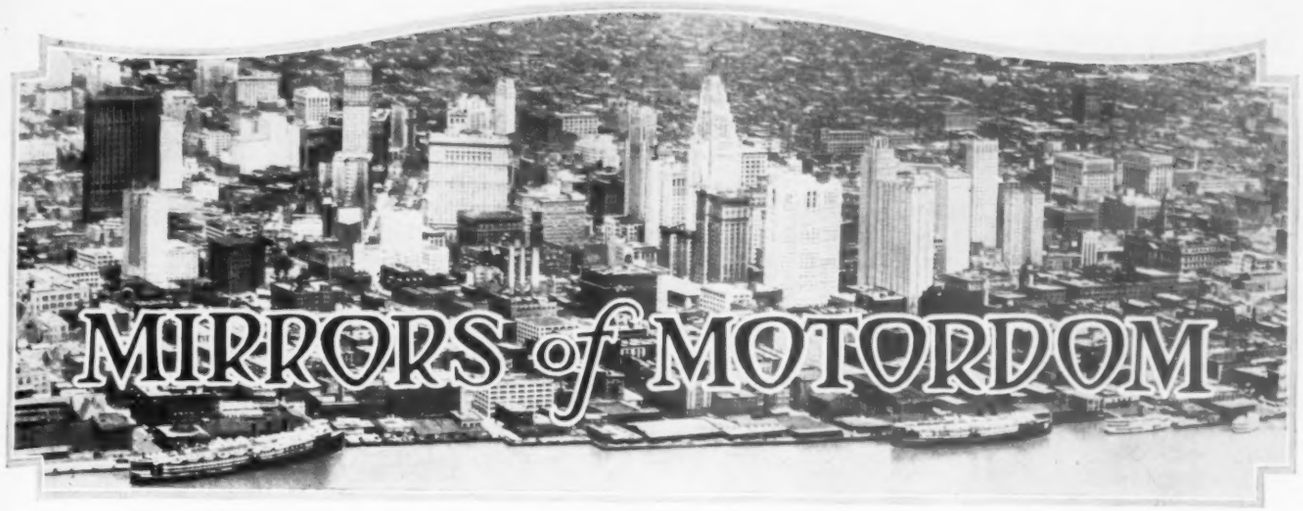
Item	Feb., 1933	Jan., 1933	Feb., 1932
Pig iron	8,416	6,444	5,734
Sponge iron	53		
Ferromanganese, spiegeleisen (1)	875	3,556	2,678
Ferrochrome (2)			
Ferrosilicon (3)		4	12
Other ferroalloys		1	100
Scrap	204	212	558
Steel ingots, blooms, billets, etc.	53	3	16
Concrete bars	182	266	2,185
Hollow bar, drill steel	74	84	31
Merchant steel bars	1,812	1,664	3,195
Iron slabs		1	
Iron bars	21	16	99
Wire rods	918	1,196	843
Boiler, other plate	11	40	
Sheets, skelp, sawplate	1,042	1,237	2,735
Tin plate	20	19	26
Structural shapes	1,597	1,673	2,919
Sheet piling			
Rails and fastenings	78	201	221
Cast iron pipe, fittings		54	
Welded pipe	353	280	288
Other pipe	61	77	368
Barbed wire	1,100	1,717	1,400
Round iron, steel wire	173	155	232
Telephone, telegraph wire		16	
Flat wire, strip steel	60	65	68
Wire rope, strand	137	127	129
Other wire	63	225	73
Hoops and bands	1,751	1,445	1,896
Nails, tacks, staples	558	1,007	797
Bolts, nuts, rivets	21	20	19
Horse, mule shoes	24	35	14
Castings, forgings	91	52	102
Total	19,748	21,892	26,738

(1) Manganese content
(2) Chromium content
(3) Silicon content

EXPORTS OF IRON AND STEEL PRODUCTS FROM THE UNITED STATES

Gross Tons

Item	Feb., 1933	Jan., 1933	Feb., 1932
Pig Iron	192	371	377
Ferromanganese and spiegeleisen			
Iron and steel scrap	38,141	31,813	8,883
Ingots, blooms, billets, slabs, sheet bars	4	91	23
Iron bars	21	23	13
Steel bars	1,390	1,085	1,631
Alloy steel bars	45	30	225
Wire rods	2,035	711	2,468
Boiler plate	89	48	34
Other plate, not fabricated	428	292	758
Skelp, iron or steel	238	157	2,447
Iron sheets, galvanized	34	35	85
Steel sheets, galvanized	1,539	2,452	2,515
Steel sheets, black	1,961	2,557	2,401
Iron sheets, black	154	123	324
Strip steel, cold-rolled	473	329	676
Hoop, band, scroll iron or steel	959	615	1,664
Tin, terne plate	2,905	4,433	2,376
Water, oil, gas, other tanks not lined	24	479	214
Shapes, not fabricated	556	581	1,381
Shapes, fabricated	365	338	967
Plates, fabricated	13	12	86
Metal lath	101	52	148
Frames, sashes and sheet piling	446	31	56
Rails, 50 lbs.	670	2,315	1,802
Rails, under 50 lbs.	89	5	91
Rail fastenings	23	283	394
Switches, frogs, crossings	16	19	92
Railroad spikes	73	62	28
Railroad bolts, nuts	44	21	17
Boiler tubes, seamless	519	297	239
Boiler tubes, welded	27	5	21
Casing, oil line pipe, seamless	3,434	906	361
Casing, oil line pipe, welded	67	202	39
Seamless black pipe other than casing	20	53	20
Malleable-iron screwed pipe fittings	104	112	132
Cast-iron screwed pipe fittings	63	80	60
Cast-iron pressure pipe & fittings	216	164	92
Cast-iron soil pipe and fittings	116	190	271
Welded black steel pipe	708	514	829
Welded black wrought-iron pipe	26	32	118
Welded galvanized steel pipe	1,129	802	1,384
Welded galvan. wrought-iron pipe	15	45	62
Riveted iron or steel pipe, fittings	42	2	1
Plain iron or steel wire	254	184	507
Galvanized wire	246	206	538
Barbed wire	1,750	831	1,142
Woven-wire fencing	25	61	47
Woven-wire screen cloth	28	40	44
Wire rope	84	107	191
Other wire and manufactures	140	173	223
Wire nails	479	601	476
Horseshoe nails	51	64	45
Tacks	42	30	36
Other nails, staples	299	121	178
Bolts, machine screws, nuts, rivets, washers	241	185	263
Iron castings	80	319	176
Steel castings	47	48	126
Car wheels, axles	429	777	336
Horseshoes	3	3	2
Iron, steel forgings	224	203	349
Total	63,936	56,720	40,484



DETROIT

LOW as the production of automobiles was last week, it represented a mild gain over the preceding week, and further slight improvement is in prospect this week.

After operating three days, Chevrolet shut down most divisions Wednesday night, but was to resume Monday on a better basis. Chrysler stepped up assemblies of its Dodge line, which now also includes a 2-door sedan in the 6-cylinder series. Plymouth and DeSoto are back on a 5-day week.

Continental expects to be operating both its Detroit and Muskegon plants this week. Federal Motor Truck has resumed. Most other manufacturers are operating, though in desultory fashion with schedules unbalanced as between departments.

Of the outside manufacturers, Studebaker resumed at South Bend on an accumulation of orders during the banking holiday. Willys recalled over 1000 following court sanction to proceed on 4400 trucks for the International Harvester Co.

Brewery Interest Tops Auto

Iron and steel releases last week were as light as at any time during the holiday. Willys through its receivers specified only the material required to balance stocks for its truck order. Ford placed a little strip. There was more interest last week in brewery and allied requirements than in automotive needs.

Barring an unexpected betterment this week, March assemblies of motor vehicles will be so light as to endanger the previous low of the depression—48,702 units in October, 1932. It will be recalled that production, from this low, built up to 130,114 units in January, then eased to an estimated 95,000 to 100,000 units in February.

April is indistinct at this time, but every expectation is for some improvement. Hopes for a moderately good spring market in other districts have not entirely faded. Ford continues to develop the light, low-price line, and there is an unconfirmed report of an April body schedule of 50,000.

Events appear to be pushing the usual spring selling season somewhat later. If the Roosevelt program restores confidence, or if inflation—which Detroit views both as inescapable and as the only salvation—develops, a sharp turn in the situation is possible. Probably never before has so large an industry lived on so strictly a day-to-day basis.

A New Bank, at Last

Obviously, the opening of the new National Bank of Detroit, into which the General Motors Corp. and the Reconstruction Finance Corp. each has put $12,500,000, is an important phase of rehabilitation, especially since Detroit has been practically without banking facilities since Feb. 11, yet it only emphasizes the tragic individual and industrial adjustments that are nearing.

On the first day of the new bank—last Friday—only commercial deposits were accepted. These included $4,000,000 by Chrysler and $2,000,000 by General Motors Acceptance Corp. The initial step in liquidating the two closed banks is expected to free 30 per cent of deposits this week, in addition to two 5 per cents previously available. But a prolonged tieup of the remaining 60 per cent, plus the process of offsetting loans with deposits, promises to be fatal in many directions.

The organization of the new National Bank of Detroit proceeded despite opposition fomented by the city police commissioner on the basis the city was being "sold to outsiders." The reference was to the Morgan interest in General Motors, afterward said to be about 3 per cent. An offset to this campaign was the espousal of the new bank plan by Detroit's radio priest.

While tenders were reported to have been made to the Fords to co-operate in organizing the new bank, they were not accepted. The present setup, in which Detroit has only one commercial bank of any size, compels the Fords to do their Detroit banking in the new institution, half owned by General Motors, or create their own facilities.

General Motors has emphasized that it has engaged in the banking business only after six weeks of stagnation failed to mature other plans, and because its interest in Detroit is sufficient to warrant it putting its resources into a rehabilitation program.

Considerable interest attaches to the fact that the most serious banking difficulties were encountered in the so-called automotive crescent—a belt which sweeps south from lower Michigan to Toledo and then east to Cleveland and south to Akron.

No Receivers in Michigan

With due regard for the proprieties, lower Michigan accounts is an achievement that, despite all its financial grief, none of its automobile manufacturers have become publicly, financially embarrassed. The only two major receiverships—Willys-Overland and Studebaker—are outside the state.

Studebaker's net loss in 1932 after charges was $8,279,806, Pierce-Arrow's $3,032,430, and White Motor's $3,618,000—a total of $15,000,000 for the principal units of the Studebaker, which supplies one key to the situation. Failure to obtain complete control of White and thus merge its assets may be another. Meanwhile, operations are being continued at all units.

Chrysler is using a nickel-chromium-molybdenum mixture for the engine blocks for commercial cars and the Imperial eight. . . .A Cleveland mill is offering sized, hot-rolled, open-hearth bars with a plus or minus tolerance of 0.004-inch. . . . White claims performance of 250,000 miles without grinding valve seats and 75,000 miles without tappet adjustments for a special exhaust valve seat in its 6-cylinder trucks.

Steel Victor in Coast Earthquake

AN I-BEAM that let go when the entire brick front and sides of the structure fell to the ground was the only fallen piece of steel in the recent earthquake in Long Beach, Calif., and vicinity, states W. E. Emmett, district engineer at San Francisco for the American Institute of Steel Construction, New York.

Steel-framed buildings and masonry curtains showed irregular cracks and occasionally sheared off. Many steel lintels are visible because the brick firewall was not properly anchored, and many store fronts are still intact below the lintel for no other reason than that the lintel held, according to Mr. Emmett.

The 12-story steel-frame city hall in Long Beach suffered quite a bit from failure of hollow tile filler walls. The highest structure in Long Beach—the Villa Riviera hotel and apartment—has a steel frame and came through with only a few plaster cracks, Mr. Emmett reports.

The Los Angeles chamber of commerce states that no properly constructed reinforced concrete or steel structures were injured and that this constitutes another argument for a rigid California building code.

Business News Of Washington

WHILE President Roosevelt's farm relief and emergency work plans have an indirect bearing upon iron and steel, the forthcoming railroad plan is of greater importance. What seems to be in prospect, is virtually a consolidation of the railroads under a government agency for operation, with elimination of overlapping services and virtually a pooling of equipment. Important developments along this line are in prospect within ten days.

Reorganization plans of the new administration may take the form of placing the interstate commerce commission, shipping board and several other similar organizations under Secretary of Commerce Roper.

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A notice of suspected dumping from Germany has been issued in connection with importations of ferromanganese, according to the bureau of customs. The order was issued on shipments coming through Philadelphia.

Notices of suspected dumping still under investigation include several iron and steel products from the Saar Basin and woven wire fence from Germany.

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Reconstruction Finance Corp. loans include $100,000 to Virginia, Ill.; $75,000 to Flemingsburg, Ky.; $65,000 to Owenton, Ky.; $40,000 to Greensburg, Ky.; $38,000 to Sulligent, Ala.; $35,000 to Marion, Ky. and $20,000 to Thomasville, Ala., all for waterworks construction, requiring various quantities of iron and steel pipe and some storage tanks.

Corn for Rails Start of S. American Barter Trade?

ALTOS HORNOS DE VIZCAYA, Spanish producer of rails, will supply 17,000 tons of rails to the Argentine state railways, accepting corn in payment, it is reliably stated in New York.

This transaction convinces American steel export executives that American producers, with the co-operation of the government, also may have to barter to obtain their portion of steel business in South America.

Brazil is regarded as the most promising outlet in South America for American steel—the more promising because imports from Brazil are twice the value of its purchases here, and coffee is permitted free entry.

Colombia also would have coffee to offer. In addition to corn, Argentina has wheat and beef to barter.

Incidentally, this is believed to be the first time a Spanish producer of rails has booked export business.

Died:

THOMAS F. FERRY, 61, founder and president, Ferry Cap & Set Screw Co., Cleveland, March 21. As a boy, Mr. Ferry became an apprentice in the Falls Rivet & Machine Co. Later he was employed by the Cleveland Automatic Machine Co. and the National Screw Mfg. Co., organizing his own company in 1906.

□ □ □

John McMyler, former president of McMyler-Interstate Co., Bedford, O., at St. Petersburg, Fla., March 20 Founder of the McMyler Mfg. Co., he was a prolific inventor, one product being a car dumper. His company absorbed the Interstate Engineering Co., also of Bedford. Since retiring in 1917 he divided his time between Cleveland and Florida.

□ □ □

R. G. Manning, before his retirement in 1928 chief engineer at Ambridge, Pa., shops, American Bridge Co., Pittsburgh, at Ambridge, recently. He was 65 years old, had been with the American company since 1906. In 1928 he resigned and became vice president of the Ambridge Savings & Trust Co., Ambridge.

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Frederick Erdle, 60, former vice president, Erdle Perforating Co., Rochester, N. Y.

□ □ □

Louis Schimmel, founder of Detroit Gray Iron Foundry Co. and Detroit Alloy Steel Co., Detroit, March 12.

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George F. Thesmacher, 59, partner and treasurer of Riester & Thesmacher, Cleveland, and prominent in the National Sheet Metal Contractors' association, March 24.

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Floyd A. Deahl, 49, of Deahl & Sommers, Cleveland, March 23. He assisted in formation of the Continental Steel Corp., Mid-States Steel & Wire Co. and Empire Steel Corp.

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Marshall Lapham, 65, president, Spiral-Rolled Products Co., New York, at Tompkinsville, Staten Island, N. Y. Born near Kalamazoo, Mich., he attained prominence as an accounting and financial man in the steel industry, having been comptroller of the former Lackawanna Steel Co., Buffalo, and Midvale Steel & Ordnance Co., Philadelphia.

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Joseph E. Fischer, 74, pioneer of the Wisconsin malleable casting industry, March 19. He served as general superintendent of the Western Malleables Inc., Beaver Dam, Wis., and its predecessor concerns, from 1896 to 1920. Previously he was general superintendent of the Milwaukee Malleable Iron Co., Milwaukee, and the Belle City Malleable Iron Co., Racine, Wis.

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Robert M. Henderson, 46, vice president and manager, Walworth-Alabama Co., Attalla, Ala., March 19 at Birmingham, Ala. Graduate of Cornell, electrical engineer with Westinghouse, later with Alabama Power Co., and National Pipe & Foundry Co., Attalla, he remained with Walworth-Alabama when that foundry was acquired.

□ □ □

William G. Watt, 64, former secretary and treasurer, Witherow Steel Co., Pittsburgh, at San Diego, Calif., March 16. Born in New Castle, Pa., he went to Pittsburgh when a young man and entered the coal business, later becoming secretary to William Witherow. On the date of the organization of the Witherow Steel Co. in 1913 and through 1929, at which latter time he retired, Mr. Watt was secretary and treasurer.

Industrial Men in the Day's News

Edward P. Connell, Vice President, The Falk Corp.

HE has risen to high position with the Falk Corp. through the accounting and the purchasing departments.

MEANWHILE, he has been active in the Gear Manufacturers' association, being a tireless advocate of standardization.

A NATIVE of Marquette, Mich., the name Marquette has been a happy association for him.

EDWARD P. CONNELL, who as noted in the Feb. 6 issue of STEEL was appointed a vice president of of the Falk Corp., Milwaukee, has been associated with that corporation all of his business life, except for a brief early experience with the Lake Shore Engine Works, of Marquette, Mich.

Marquette is a name which has been significant throughout Mr. Connell's career. He was born at Marquette; was educated in the local schools there; it is the name of the university attended by his eldest son; it is the university for which he is an enthusiastic rooter; and it is around Marquette that he finds his recreation, after the golf season ends.

Going with the Falk Corp. after leaving the Lake Shore Engine Works, Mr. Connell progressed through the accounting and purchasing ends of the business, becoming comptroller in 1924. Since then, his duties have been extended to both selling and production, so that he is active now in the direction of virtually all the departments of the business.

Mr. Connell was one of the first executives to recognize the need for standardization of speed reducers and a rational method of rating of both of these products in the interest of economy for both manufacturer and consumer.

He also is treasurer of the Claybourn Process Corp., Milwaukee, manufacturer of printing presses and platemaking equipment.

WILLIAM P. WOODSIDE, Detroit, has been elected vice president in charge or research, Climax Molybdenum Co., New York. Mr. Woodside, who has been identified with the company in a consulting capacity since 1926, previously was manager of materials and standards department, Studebaker Corp., South Bend, Ind., and with the sales department of the Crucible Steel Co. of America. He also is vice president of the Climax Molybdenum Co. of Michigan. He is one of the two surviving members of the group of three founders of the American Society for Steel Treating.

□ □ □

A. S. Kennedy, for the past five years sales engineer in Missouri, Kansas and Nebraska for a general line of power transmission, elevating and conveying equipment, has been appointed manager of the new branch office at Kansas City, Mo., of the Chain Belt Co., Milwaukee. The territory of the new office formerly was covered by the St. Louis office.

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Ralph E. Flanders, vice president, Jones & Lamson Machine Co., Springfield, Vt., and associated with it since 1912, has been elected president. He succeeds James Hartness, who retired recently after 43 years with the company. K. H. Woolson becomes vice president.

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W. G. Black, supervisor of purchases and stores for the Chesapeake & Ohio and Pere Marquette railroads, will serve in the same capacity as well for the Nickel Plate railroad. His headquarters are at Cleveland.

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M. F. Holahan, recently manager of domestic sales for the International Harvester Co., Chicago, has been elected a vice president of the company in charge of sales.

George A. Ranney, who is resigning as vice president to become vice chairman of three Chicago utility companies, will continue as a director and member of the finance committee of the Harvester company.

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Robert H. Wilson has been appointed consulting engineer, Kibele Mfg. Co., San Antonio, Tex., manufacturer of oil well supplies. He will make headquarters in Houston, Tex.

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William W. Coleman, president, Bucyrus-Erie Co., South Milwaukee, Wis., has been elected chairman of the board of directors of the Milwaukee Community Fund to fill a vacancy. He served as president of the organization and for many years as a director.

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James Inglis, president, American Blower Co., Detroit, has been elected chairman.

Clark T. Morse, vice president, now is president.

EDITORIAL

Criticism of Merchandising Is Deserved and Timely

AN INDICTMENT of the steel industry by an outsider appears on page 13 of this issue. We present it—unedited as to substance of text—in the belief that sincere criticism from outside sometimes carries more conviction than that emanating from within the industry.

We do not agree with "Outsider" on all counts. For instance we doubt whether producers or consumers would relish action by state governors in accordance with the Oklahoma Bill Murray pattern. Nor do we believe that a Will Hays or a Judge Landis in the steel industry would produce the desired results. But on most of the other counts, and certainly on the general charge of neglect in merchandising, "Outsider's" criticism is well grounded.

For instance, it will be difficult for anyone to find flaws in the author's stethoscopic and microscopic examination of the steel business, unless one quibbles over the run-down condition of some of the physical properties of the industry. But the author's diagnosis is most revealing when it touches the industry's life blood —merchandising:

> "Move the stethoscope up a little higher. Place it on the merchandising artery. Those weak pulsations are sales efforts. Maybe we have located some of the trouble. Let's take a blood smear and look at it under the microscope. Those tiny cells are merchandising. Those big cells attacking the little ones are cut prices. A most unhealthy condition. The patient will have to be treated until this condition is reversed. . . . Merchandising must be put ahead of price. . ."

Too Intent on Developing New Business To Worry Unduly About Prices

Here is the key to much of the trouble in the steel industry. Even today, when volume is extremely low, the majority of sellers of steel would be better off if they gave more attention to merchandising and less to prices. Talk with merchandising-minded executives of some of the smaller companies and you will find that they are not worrying very much about prices. Their thoughts are centered on helping their customers to use steel more advantageously. Their attitude toward actual or potential users of steel is one of helpfulness. They practice the philosophy of "We'll try to give you what you want." This policy is so different from the too prevalent philosophy of "It can't be done" that considerable small-tonnage business has been drifting away from the poor merchandising to the good merchandising steel sellers. When business picks up, a similar drift will be noticeable in large-tonnage orders. The large producers who develop the best merchandising methods gradually will take business from those who still are depending upon rule-of-thumb tactics.

The morale of junior steel salesmen is a good index of the merchandising policies of their employers. You cannot engage in conversation with many such salesmen without encountering a few who are frankly apologetic over the failure of their superiors to grasp merchandising opportunities. Their morale is at low ebb. They seem to be working in a daze of misunderstanding as to just what is expected of them. They feel they are at a disadvantage with competing salesmen because of the seeming lack of progressiveness higher up in their own companies.

Best Morale Is Found in Sales Forces Engaged in Real Selling, Not Order Taking

On the other hand you will find that the salesmen of a few companies are bubbling over with enthusiasm in their work. Before you have talked with one of these men five minutes he will pull out an envelope and sketch a rough plan of a machinery detail for which he has just sold the steel by showing the customer what is best for his requirements. Prices are secondary with him. His company encourages and supports him in real merchandising effort and not in order-taking on a price basis.

Fortunately the outlook for improved merchandising is improving. In fact, recent criticism of sales and promotion activity in the steel industry has been tempered considerably by the knowledge that several of the largest corporations now are engaged in strenuous efforts to reshape their merchandising policies and to reorganize their sales and promotion departments. Two or three of the ten largest producers have made remarkable progress in this respect in the last two years.

Notwithstanding this progress in a few companies the goal still is far away. Probably not more than a dozen of the 50 most influential executives in the steel industry are giving the attention to merchandising that it deserves. Until the attitude of the majority in high places is more favorable to intelligent merchandising the steel industry will continue to labor under a severe handicap in its competition with more progressive industries.

THE INDUSTRIAL DIAL

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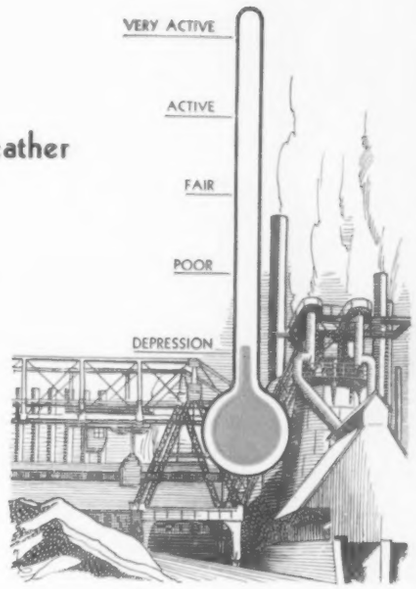
MARCH, 1933, will go down in the annals of American economic history as the month of the great denouement of post-war financial folly. All through 1932 well informed observers of business had known of smoldering fires of trouble, arising from boom-time speculation, greed and dishonesty, but they hoped that by careful maneuvering the inevitable outbreaks could be localized and thereby kept under a semblance of control so that a general conflagration would be avoided. These hopes were destroyed in February when the governor of Michigan declared a state-wide bank holiday. By March 1 the scattered fires were spreading rapidly and on inauguration day the entire nation was engulfed in their sweep.

Then came action! The President demanded and was granted emergency authority. All banks were closed by federal command, stock exchanges were ordered to close, exporting of gold was banned, hoarded gold was called from hiding, emergency banking and currency legislation was rushed through congress. An economy bill was introduced, 3.2 per cent beer was made legal, and farm relief and employment measures were recommended to congress. Meanwhile about 13,000 of the country's 18,000 banks were reopened.

Today, after three hectic weeks of drastic action, we can begin to take advantage of the easing tension in order to study what has happened. Confidence has been restored to an encouraging degree, but the first flush of optimism has been dimmed somewhat by the sober contemplation of the gigantic task that still is ahead of us. The magnificent first-day rebound of the stock market has lapsed into a more steady gait. The initial spurt of certain commodity prices has been partly offset by losses.

The outlook is not uniform throughout all industrial sections. If you are in Detroit, Cleveland, Akron, Baltimore or New Orleans your mind will turn to difficult problems of finance that are not as apparent to your contemporaries

Industrial Weather



TREND:
Not Clearly Defined

The Barometer of Business

Industrial Indicators

	Feb., 1933	Jan., 1933	Feb., 1932
Pig iron output (Daily average, tons)	19,752	18,348	33,122
Machine Tool Index	15.2	33.1	54.8
Unfilled orders (tons)	1,854,200	1,898,644	2,545,629
Ingot output (Daily average, tons)	44,378	38,704	58,382
Dodge Bldg. awards in 37 states (sq. ft.)	7,382,400	8,453,000	12,299,000
Automobile output	*90,000	133,472	122,890
Coal outut, tons	27,220,000	27,060,000	28,013,000
Business failures, number	2,378	2,919	2,732
Business failures, liabilities	$65,576,068	$79,100,602	$84,900,106
Cement production, Bbls.	2,772,000	2,958,000	3,971,000
Cotton consumption, bales	442,000	471,000	451,000
Car loadings (weekly average	489,495	477,624	708,530

*Estimated.

Foreign Trade

	Feb., 1933	Jan., 1933	Feb., 1932
Exports	$100,000,000	$120,593,000	$153,930,000
Imports	$83,000,000	$96,000,000	$130,978,000
Gold exports	$21,521,000	$14,000	$128,211,000
Gold imports	$30,381,000	$128,465,000	$37,644,000

Financial Indicators

	Feb., 1933	Jan., 1933	Feb., 1932
25 Industrial stocks	$84.55	$90.50	$117.55
25 Rail stocks	$21.43	$22.48	$29.37
40 Bonds	$65.46	$66.60	$70.10
Bank clearings (000 omitted)		$19,949,176	$21,085,028
Commercial paper rate N. Y. (per cent)	1¼	1½	4
*Commercial loans (000 omitted)	$9,865,000	$12,935,000	$7,148,000
Federal Reserve ratio, per cent	55.3	65.6	68.1
†Railroad earnings	$13,265,721	$32,856,893	$11,182,051
Stock sales, N. Y. stock exchange	19,319,900	18,719,502	31,718,556
Bond sales, par value	$231,539,700	$263,030,600	$222,546,250

*Leading member banks Federal Reserve System.
†January, December and January, respectively.

Commodity Prices

	Feb., 1933	Jan., 1933	Feb., 1932	Monthly Av. 1913
STEEL's composite average of 14 iron and steel prices	$28.31	$28.68	$29.56	$26.32
Bradstreet's index	$6.35	$6.53	$7.31	100
Wheat, cash (bushel)	67c	66c	77c	92c
Corn, cash (bushel)	40c	40c	50c	51c
Petroleum, crude (Bbl.)	42c	42c	75c	$2.50

Exports

Feb., 1933	$100,000,000
Jan., 1933	120,593,000
Feb., 1932	153,972,000

Imports

Feb., 1933	$ 83,000,000
Jan., 1933	96,009,000
Feb., 1932	130,999,000

in Chicago, Pittsburgh, New York or Philadelphia. The resumption of adequate banking facilities in the first named five cities is being attended with difficulties which will seriously retard industrial recovery.

Until business has had more time to adjust itself to the new conditions, the ordinary statistics of production and distribution will hold little significance. The figures for March will be abnormal and will serve no useful purpose other than to register the degree of resistance to the shock of the momentous happenings of that eventful month.

Here and there are signs of a quickening interest in certain products but the measure of new business will not be discernible in the monthly statistics for March. Appraisal of the first tangible effects of the recovery will have to wait for the business figures of the months of the second quarter.

Where Business Stands

Monthly Average, 1932 — 100

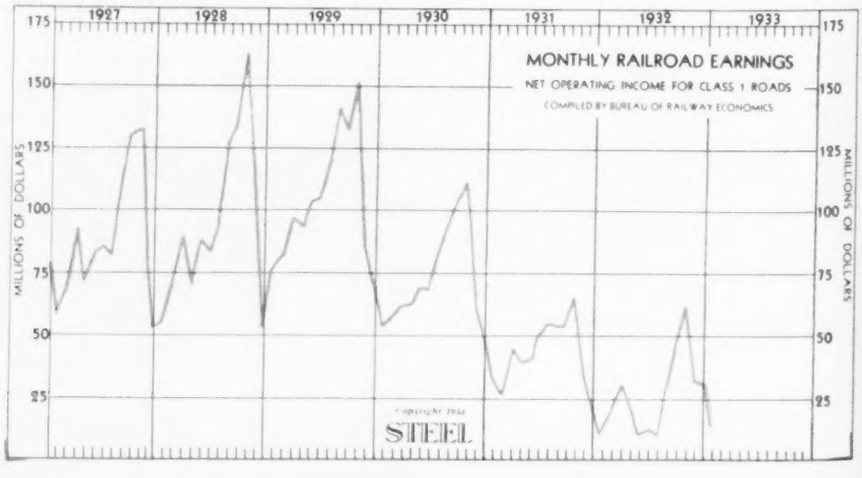
	Feb., 1933	Jan., 1933	Feb., 1932
Steel Ingot Output	105.7	92.2	139.0
Pig Iron Output	83.4	77.4	139.7
Freight Movement	90.2	87.9	103.0
Building Construction	56.8	65.0	94.6
Automobile Output	75.5	97.1	103.0
Wholesale Prices	89.4	92.0	102.9

February Exports Lowest Since 1904; Imports Share in Decline

The total value of this country's foreign merchandise trade during February was estimated at $100,000,000, compared with $120,593,000 in January. It represented the smallest monthly volume since August, 1904, when exports dropped to $92,254,000. According to the bureau of foreign and domestic commerce, the value of imports declined to $83,000,000, but were still considerably above the $79,421,000 of imports for July, 1932, which established a low point for recent years.

Railroads Earn Only 0.92 Per Cent In Month of January

Class 1 railroads of the United States for January had a net operating income of $13,265,721 which was at the annual rate of return of 0.92 per cent on their property investment. The current figure represents a reduction of 67.7 per cent from the December income and compares with $11,182,051 net earnings in January, 1932. This compilation from the Bureau of Railway Economics is based on reports from 150 class 1 railroads.



Jan., 1933	$13,265,721
Dec., 1932	32,856,895
Jan., 1932	11,182,051

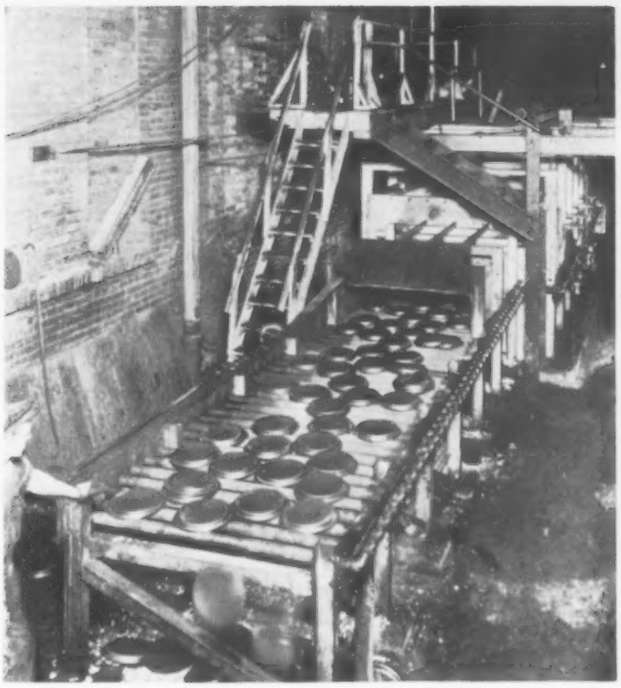
FABRICATING AND FINISHING METAL STAMPED WARE

By J. B. NEALEY

IN THE field of metal stamped ware lies broad opportunity for engineering ingenuity, for variations in die design and application of improved machine methods are means to effect decreased costs. Furthermore, equally as important as the fabrication of these products is surface finish, the most popular finishes including japanning, galvanizing, lithographing and enameling, applied by dipping, spraying or by rolls.

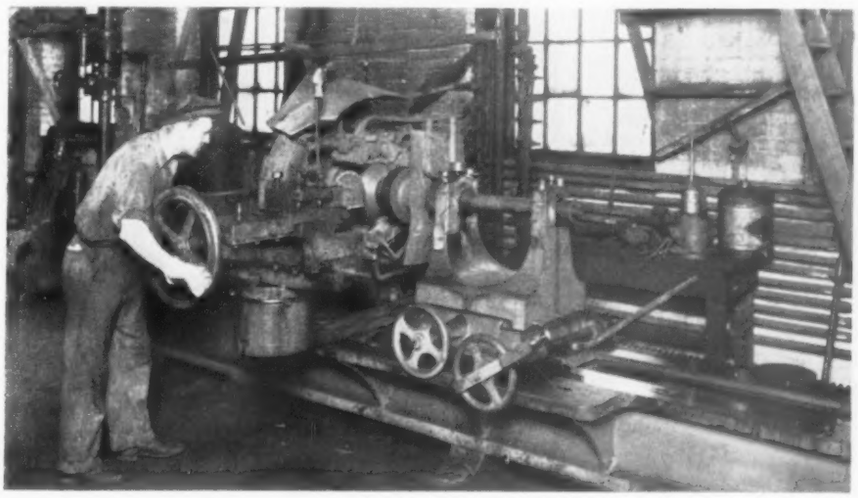
Heat performs an essential function both in the working of the metal and in the application of the finishes. In the processing of steel heat is required to anneal between draws; and in the finishing it is needed to bake or dry the various coatings so as to insure a permanent bond and to increase durability.

Many examples of engineering ingenuity are to be found in the plant of the National Enameling & Stamping Co., Milwaukee, where more than 3000 different stamped metal items are manufactured. These include a complete line of kitchen utensils and allied products, as well as gasoline and kerosene stoves, oil cans, milk cans, and the like.



Discharge end of gas-fired furnace in which milk can parts are annealed. This view shows the cooling zone and open conveyor consisting of rotating rolls. The motor and speed reducer for operating the conveyor are mounted above the furnace

Heavy stamping is accomplished in two large divisions with row upon row of vertical presses for heavy work, inclinables for lighter parts and lathes for cold and hot spinning. Seamless oil cans, one of the products, are formed from circular blanks of 16 or 18-gage sheet steel with four draws and two anneals for the 5-gallon size and five draws and three anneals for the 10-gallon size. The shell so formed is chucked in a lathe, as shown in an accompanying illustration, and the portion close to the open mouth heated for spinning with a circle of gas burners joined to a circular manifold. Eight burners make up the set, each consist-



Forming the shell of seamless oil cans in a lathe with eight gas burners applying heat directly

The shell is rotated and when up to heat is shaped against a mandrel by a spinning wheel

ing of a hollow cast-iron block with ports drilled on the inner face for the gas flames. A combustible mixture of gas and air is forced through the manifold into these burners.

The shell is rotated and when up to heat a mandrel on the tail piece of the lathe is pushed into the open end and the operator presses a spinning wheel against the hot end of the can and forces it down against the mandrel, thus completing the shape of the can. The top is trimmed, beaded and finished and the handles and hoops put on in another department.

Three Anneals Are Required

Breasts of milk cans are made in ten operations as follows: Blanking; first and second draws; first anneal; third draw; second anneal; size in punch press; trim; third anneal; bead edge of mouth of can; and finally burn off grease and dirt in a gas furnace preparatory to finishing.

The annealing is accomplished in a gas-fired furnace which is continuous and automatic both as to operation and temperature control. This furnace, shown in one of the illustrations, is built of brick, steel encased and insulated, and is 13½ feet long. The work is carried through continuously on a conveyor consisting of 1½-inch diameter hollow, alloy steel rolls placed on 5-inch centers. These are about 7 feet long and extend across the furnace and through the side walls, ending in bronze bushings which are located in two long channel irons, one on each side of the furnace.

This roller hearth extends 3 feet beyond the charging end and 15 feet beyond the discharge end, with about 5 feet of the latter covered with a sheet steel box 1½ feet high which serves as a cooling zone to the furnace proper. The rolls, rotated by chains and sprockets, are divided into three groups, all operated from one motor. The furnace is divided into three zones, heating, soaking and cooling and the rollers in these zones are driven at different speeds—low speed in the heating zone, faster in the soaking zone and still faster in the cooling zone.

Heat is supplied through 24 gas burners, twelve to a side and of these four fire above the hearth and eight below. These burners are high-pressure venturi type with single-valve control for gas-air proportioning by which the furnace atmosphere is automatically maintained slightly reducing to minimize oxidation. Two temperature controllers are provided, one in the heating zone and the other in the soaking zone, each controlling the flow of fuel to the burners in its section, by means of motor-operated valves which are located in the two gas supply lines.

Furnace Automatically Controlled

In the milk can department, hot hoops are shrunk in the breasts and the breast roll welded to the sheet steel body of the can, which is seam roll welded. These steel hoops are heated in a slot-type forge furnace of brick, 6 feet long, 4 feet wide, 3 feet high and resting on 2-foot legs. This unit is equipped with four gas burners in each end firing directly into the heating chamber. These suction T-burners, operating at 1 pound pressure, are furnished by a motor-driven turbo which sucks in gas through a nozzle mixer. A safety device, in the form of a magnetic valve in the gas supply line, is kept open by an electric current and in case of current failure, automatically shuts off the fuel flow to the burners. The bottom of the milk can is made in a single draw and is then riveted and soldered to the can body.

Lithographed products such as trays, cannister sets, match boxes, waste baskets, and the like, are formed from tin plated steel sheets, the decorations being lithographed on the metal prior to forming. In lithographing, the tin plate is run through a coating machine consisting of transfer rolls which apply the base color. The sheets then are delivered directly between steel wire uprights on closed loop chains, sprocket-driven, which compose the conveyor to the lithographing oven in which the wet color is baked on. These uprights are only about an inch apart.

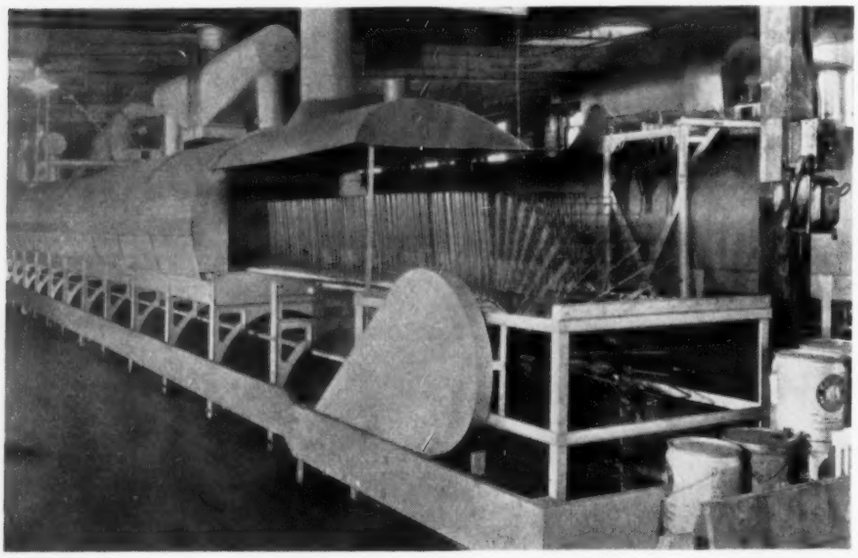
The oven, shown in an accompanying illustration, is of sheet steel with 2½ inches of insulation, and is circular shaped on top and flat on the bottom. It rests on 3-foot legs and is 86 feet long and 5 feet in diameter. One side of the conveyor and uprights travels through the oven while the other returns in the space below. Heat is supplied indirectly from a gas-fired heater, which sets on top of the oven.

Air Is Recirculated

This heater is circular in shape, 2 feet in diameter and 5 feet long and is equipped at one end with a blast burner with a venturi. At the other end is a motor-driven fan which sucks out the hot air and forces it down into the oven, where it is distributed evenly throughout the oven by means of a 5-inch slotted pipe running along the floor for its entire length. After working up through the oven this hot air is removed through a similar slotted pipe close to the roof of the oven. This air is then forced through the heater where it is reheated and then recirculated in the oven. A certain amount of fresh air must be admitted continuously, of course, and this is pulled in through an opening in the top of the heater, damper controlled.

Excess air is pulled out through four slots in the top of the oven and vented through the roof of the building. Exact temperatures, 150 to 350 degrees Fahr., are mechanically maintained in the oven by means of an automatic temperature control. This consists of an expanding element which directly opens and closes a shutoff valve in the gas supply line. A recording pyrometer is part of this equipment. The conveyor extends about 8 feet beyond the discharge end and is hooded above. Below are two motor-operated fans which blow cold air up on the work so as to cool it and is carried away through vents in the top of the hood. Operators stand along this exposed portion and transfer the sheets to trucks.

Two of these ovens are provided, the second being in line with a lithograph press which transfers the decorations to the sheets and then de-



This oven, one of two, is used for baking wet color on lithographed tin plate. Heated air is forced through the oven. All lithographing is done before the metal is formed

livers them to the oven conveyor in the same fashion as to the conveyor of the base color furnace. Many different colors are employed in lithographing.

Dust pans are another product made in this plant. Two pans are stamped integral from one sheet of steel in a press after which the edges are beaded by a stationary tool while the stamping is rotated in a specially-constructed form. The pans are next cut apart and the handle hole punched in each in a specially-designed punch press. In the next operation, the edge is straightened in a punch press. The last three machines are grouped in a half circle as shown in one of the illustrations, and one operator serves all of them. In the final operation, handles made in another department are riveted on.

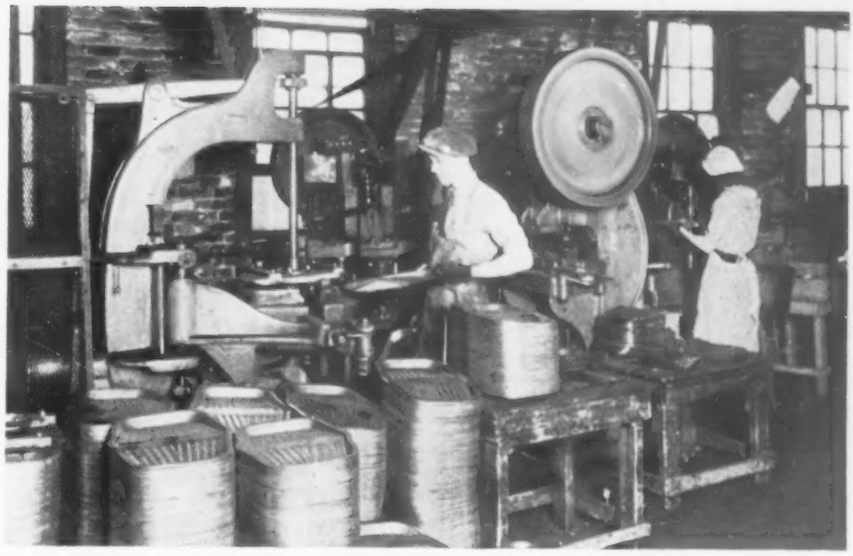
Japanning Equipment Provided

Many products of this plant are japanned, and the unit in which dust pans are dipped and baked is particularly efficient. The dipping and draining unit is 20 feet long and 10 feet wide and consists of two parallel motor-driven loop chains between which steel rods are suspended. An operator at one end of this unit hangs the work on rods and then transfers the work to the oven racks.

The oven is of sheet steel, and is 12 feet long, 7 feet high and 5 feet wide, and is heated indirectly with a gas-fired heater like those on the lithograph ovens. The distribution and recirculating systems also are very similar. The big steel racks, into which the wet work has been put, are suspended from an overhead track that runs in and out of the oven.

A particularly unique setup in this plant is one for the making of a four-piece cannister set for sugar, flour, tea and coffee. In order not to have a run of one size lag behind that of another, all four sizes are made simultaneously in a group of five machines, operated by a single crew.

Many specially designed and built-up units are in evidence throughout the plant and all combine to make for high speed of production and maximum efficiency of operation.



Dust pans are made continuously and rapidly with this group of machines. The last three machines are placed in a half circle and are served by one operator. The pans are finished by japanning

Publishes Report of Tests Made on Rivet-Bolts

About a year ago, the Dardelet Threadlock Corp., 120 Broadway, New York, placed on the market a new fastening designated as a rivet-bolt. This fastening, described in STEEL, July 25, 1932, page 28, was designed to make connections in field construction.

To determine the value of this fastening, the manufacturer commissioned Columbia university to make an extensive series of tests. The investigation was completed recently and the results have been published in booklet form, copies of which are available upon request to the Threadlock corporation.

This report, titled "Comparative Load-Displacement Tests on Butt and Lap Joints Assembled with Dardelet Rivet Bolts and Hot-Driven Rivets," consists of 32 pages of data, graphs and illustrations derived from the investigation (STEEL, Jan. 16, p. 24).

Lists Properties and Uses Of Barium Carbonate

Witherite or natural barium carbonate is a relatively rare mineral which at the present time is used in some form in seven major industries. In the metallurgical industry it is used in compounds for case hardening and in enamels for cast iron ware.

Occurrence, preparation, physical properties and uses of this mineral are discussed at length in a 20-page booklet prepared by the Foote Mineral Co. Inc., 1609 Summer street, Philadelphia. Copies are available upon request.

The bulletin points out that recent reliable research work shows that, contrary to previously accepted theories, the action of barium carbonate is not due to the formation of volatile cyanides by the action of the nitrogen of the occluded air, but exclusively to the formation of carbon monoxide. This carbon monoxide is produced by the reducing action of hot carbon on the carbon dioxide evolved from the witherite.

One of the best solid case hardening compounds for general use, it is stated, consists of 40 parts of barium carbonate and 60 parts of powdered wood charcoal. The preparation of this mixture consists simply in finely grinding and intimately mixing the wood charcoal and barium carbonate. Some manufacturers supply the product in the form of pellets or granules through the addition of certain bonding agents.

As regards enamels, the bulletin asserts that the more recent American ground-free cast iron enamels contain up to 12 to 16 per cent of barium oxide added in the form of barium carbonate. Advantages claimed are low cost, higher gloss, improved coefficient of expansion, elasticity and resistance to organic acids.

Develops New Pure Iron Suitable for Many Uses

A new pure iron known as Svea metal has been developed and placed on the market by the Swedish Iron & Steel Corp., 17 Battery Place, New York. This new product is stated to be approximately 99.93 per cent pure and is intended for use in all applications where pure, soft iron, practically free of occluded gases, is required.

It now is available in cold rolled strip or wire, and also in the forms of woven mesh and extruded strip. The new iron already has gained wide use in the manufacture of radio, neon, mercury-vapor and other vacuum tubes. It is being used to some extent as core wire and in other applications in the electrical field.

It is being used as gaskets in machinery operating with high pressures and high temperatures, and also to some extent for pressing into dies which later are case-hardened. When polished and treated, the new metal shows high resistance to atmospheric corrosion.

What Will Rehabilitation of Brewing Plants Mean for Steel Industry?

(*Continued from Page* 12)

that it takes 15 men one day to produce one ton of tin plate; 55,000,000 pounds of tin plate represents approximately 412,500 days of work for one man. On the basis of 200 working days per year, it represents a year's work for 2100 men."

A revolutionary change in modern brewery construction, bringing with it the extensive utilization of steel and steel products, is foreseen by C. A. Nowak, editor, *Modern Brewery*, who states in a special communication to STEEL: "In pre-prohibition days the use of steel in breweries was largely limited to structural work, supports, stairways, etc. In the fabrication of brewery equipment, including mash tubs, kettles, pipe and fittings, copper and brass predominated.

Coating Formerly Used

Wherever iron or steel was used, such as in the construction of hot and cold water tanks and fermentation or storage vats, it was necessary to coat the metal with a film of resinous material, the purpose of which was to prevent contact of the product with the metal. Specifications for coatings of this type were insolubility in beer, resistance to ordinary antiseptics, elasticity and long life. It was of utmost importance that these coatings would in no way effect the taste or flavor of the product. Glass enameled steel vats were used in some of the larger plants.

"During the years of prohibition, activity in most breweries was at standstill. New installations were almost entirely confined to dealcoholization equipment fabricated of copper. Today much of the equipment in breweries, even though not obsolete, has deteriorated to such an extent that it needs replacement. This is especially true of the trade packages used for shipping and the cellar equipment, most of which originally was of wood construction.

"Trade packages of steel have been used abroad for some years with established success. Steel vats variously treated and stainless steel and stainless clad steel are rapidly gaining in popularity. For trade packages alone there is a potential market estimated variously at 3,000,000 units upward.

"In the decorative treatment of brewery exteriors, stainless steel offers many possibilities. The modern brewery will be distinct in architectural design—it will be smaller in size, possibly of reinforced concrete construction and embellished with metal possessing beauty and durability.

Opportunities for 18-8

"Where wooden vats are to be replaced by vats of other material, steel properly treated, stainless steel, stainless clad or steel lined with glass enamel will likely predominate."

It appears that in the field of stainless steel lie the greatest opportunities for producers and fabricators in forthcoming business from the brewery industry. Leading steelmakers in this country, taking their cue from developments in European countries, are becoming aware of this fertile field for new business and are investigating its potentialities.

C. C. Snyder, metallurgist, Republic Steel Corp., Massillon, O., observes: "Stainless steel has been used for a number of years in England, Germany and Switzerland for such equipment as road and rail tanks, yeast wagons, fermentation vessels, pipe lines, valves, buckets, shovels, yeast pans, storage and auxiliary tanks, filter parts of bottling machines, coolers, and shipping containers.

"Rust resisting steel has proved itself in this field, imparting no effect on the taste or flavor of beer. Due to its inherent properties, the steel is kept clean easily, and it is unnecessary to be continually polishing the metal, such as is the case with nonferrous metals. Numerous tests have shown the 18-8 chrome-nickel steel to be ideally adaptable to brewery equipment."

To give some idea of the equipment involved in the typical brewery it might be pertinent to review briefly certain highlights of the brewing process. Essential ingredient in beer is malt, a product obtained from grain (usually barley) through a process of steeping to supply moisture content, germinating to permit certain biochemical changes to take place, and kiln-drying to terminate the process as well as remove the excess moisture.

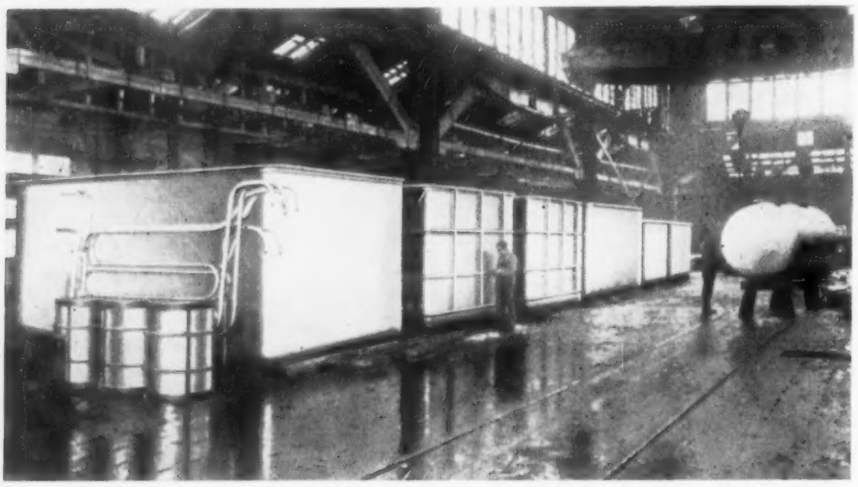
To convert this product to beer, it is first ground in milling machines, conveyed to hoppers above vats known as mash cookers, from which it is admitted to the cookers as needed. The mashing-down process —heating malt and water for about 5½ hours—is the next step, following which the mixture is let down to a lauter tub, which filters off solid material.

Boiled in Brew Kettles

The resulting liquid is known as wort. The latter is boiled with hops for about two hours in a kettle, whereupon it is again filtered and pumped to the cooler. Yeast is then added to produce fermentation which is allowed to progress for about 10 days at a low temperature.

The beer is then pumped to tanks in the aging cellar or lager cellar where it is aged anywhere from 2 to 3 months, depending upon the type and character of the beer. Finally, it is filtered, carbonated and held in storage tanks. For shipment to the consumer it is placed either in barrels or bottles; if in bottles, they must be pasteurized after being capped.

Greatest progress in the adaptation of stainless steel to brewery equipment has been made in Germany, where as early as 1925 large quantities of 18-8 chrome-nickel steel were being used for mash vats, yeast vats, fermentation vats, storage



View in German fabricating shop showing a number of stainless steel fermenting tanks or vats in process of assembly. Photo is by courtesy of Crucible Steel Co. of American

tanks, barrels, etc. Eight years of service have established the suitability of this steel in such equipment.

Crucible Steel Co. of America, New York, producer of Rezistal KA-2 stainless steel, recently published a booklet incorporating an extensive survey of the adaptation of this type of steel to brewery equipment, based largely on German practice. In this survey it is pointed out that originally some concern was felt as to whether beer, while in storage in stainless steel tanks and after being made in stainless fermentation vats, would take on a metallic taste in the course of the aging process. Comprehensive laboratory tests were made and proved conclusively that the beer retained its full normal qualities. Shipments have been made on long trips across the ocean and back again, and the beer has been found to be unaffected.

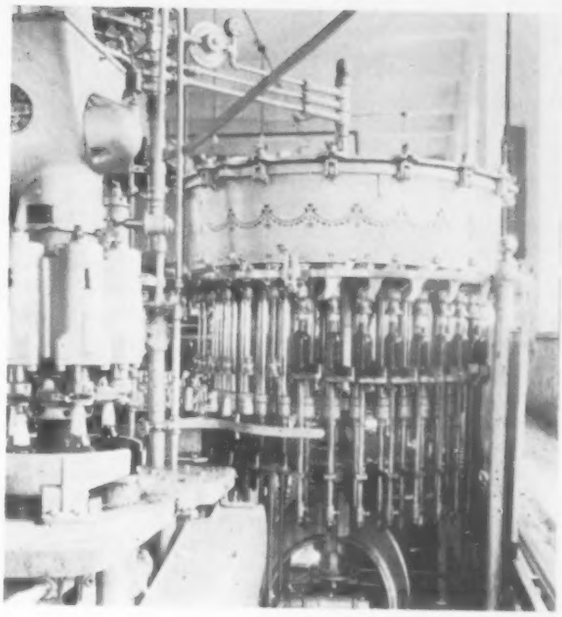
It is well known that various metals affect the rapidity of bacterial action and tend to form a limit of concentration, or a point at which a stoppage of further bacterial growth occurs. Among the most powerful acting metals along this line are mercury, copper, pure nickel, cobalt and antimony. Two weak or wholly inactive metals affecting bacterial growth are chromium and iron. From these basic effects it was deduced that stainless steel would have little effect on bacterial growth, and actual experience has substantiated this deduction.

Steel Vats Installed

An installation of stainless steel equipment was made at the Falken brewery, Schaffhausen, Switzerland, in 1927, comprising 12 large fermenting vats of 5560 gallons capacity each; six smaller vats of about 4000 gallons each; and two small yeast vats of about 850 gallons each. All cooling coils in connection with these vats also were of 18-8 steel. The tensile strength of the steel—about 90,000 pounds per square inch—permitted the use of thinner sections than had been used previously.

Fermenting vats were of welded construction. Sharp corners were carefully avoided, and all edges of the sides and from side to bottom had a radius of 10 inches, assuring easy and convenient cleaning. Welded seams on the interior of the vat were ground and pickled so that the entire inner surface had a silvery appearance.

To prove that fermenting of beer would not corrode the vat, a small vat of about 9-quart capacity and weighing 3180 grams was used to ferment beer continuously for six weeks. Subsequently the vat was cleaned and re-weighed, showing the identical weight of 3180 grams. Taste of the beer was excellent; appearance was entirely normal. Stainless steel is becoming standard material in large European breweries for vat construction.



THIS recently perfected machine fills 120 pint beer bottles per minute, and involves a wide variety of metal parts in its construction. Bottle capper is shown at the left. Photo is by courtesy of Bishop & Babcock Co.

In view of the resistance of chrome-nickel steel to the brewing and fermentation action, it was concluded that the material, when used as either storage or transport tanks, similarly would show no effect on the taste, color or fullness of the beer. Experience in the last seven years in Germany has proved this to be true. Storage tanks of stainless steel, up to 187,000 gallons capacity are now in use throughout European breweries.

A natural development was the adaptation of this steel to use in fabrication of beer barrels. As perfected in Germany, barrels of this type were found to be light in weight, durable, biologically unobjectionable and absolutely tight. The standard type of barrel is constructed so as to eliminate sharp corners in the inside which might allow a place for the collection of dirt or sediment. It can be thoroughly cleaned and sterilized by blowing out with steam, followed by a rinsing with cold water.

Maintenance Is Lower

The former danger of contamination in transport has been eliminated. Strength and durability of these barrels have largely eliminated maintenance expenses, formerly incurred with the use of wooden barrels. Lightness of the steel type also is a point in their favor. It is claimed that a truck can carry 1050 gallons in steel barrels, compared with 780 gallons in wooden barrels.

Another signal advantage of the rustless steel barrels is that pasteurization can be accomplished in the barrel rather than in the individual bottle. This is accomplished by placing a number of barrels nearly filled with beer in a large tank. Hot water is admitted and then steam is applied until the water reaches a temperature of about 150 degrees Fahr. The bath is held at this temperature for 45 minutes, the hot water drained off and cold water run into the tank. This pasteurization cannot be accomplished in wooden barrels.

In Germany, the standard stainless steel barrel comprises two pot-like halves which are brought to the desired form and depth by several draws on circular sheets, with annealing between each draw to eliminate strains. The halves are then each crimped to produce a rib, intended to stiffen the barrel, as well as to facilitate rolling.

Assembled by Welding

Both halves have spot welded protection rings extending beyond the closed-in ends. These protection rings strengthen the barrel, permit it to stand firmly in an upright position and absorb shocks in handling. Finally the two halves are welded together. In order to permit easy carrying, two rectangular openings are cut into the upper protection ring.

Referring back to the figure of 12,000,000 new barrels, estimated requirements based on production of 40,000,000 barrels of beer in a year's time, it will be appreciated that a broad field is open here for the application of 18-8 steel in barrels for the American brewery trade.

The objection has been advanced that in stainless steel barrels beer is not insulated as well as in wooden barrels, and in transport would become warm and spoil. Of course, pasteurization before shipment, possible in steel barrels, would overcome this objection. Furthermore, tests show that it requires about a week at room temperature for the inception

of new fermenting action in barreled beer.

While the beer undoubtedly will reach atmospheric temperature more quickly in a steel barrel than in a wooden barrel, it seldom is exposed to normal temperatures for more than one or two days, since freight shipments are made in refrigerated cars, and shipping from brewery to distributing plant or consumer usually does not exceed one or two days. Furthermore, the beer can be cooled more quickly in steel than in wooden barrels.

Electro Metallurgical Co., New York, has been studying the possibilities for stainless steel of the 18-8 type in brewery equipment. By courtesy of this company the comment of a German investigator, Dr. Schottky, director of the Krupp Research institute, Essen, is made available. The latter authority recalls that the exceptional rust and acid resistance of the 18-8 chrome-nickel steel is caused by the noble potential imparted to it by the chromium which it contains, and by its uniform austenitic structure. The European brewing industry, seeking to operate more hygienically, faster and with greater unity, soon became convinced of the valuable corrosion resistant properties of this steel. Favorable mechanical properties—considerable strength with high toughness and ductility—and weldability, further clinched the argument.

Object to High Cost

Probably the greatest objection to the adoption of stainless steel by manufacturers interviewed recently on the question has been the high first cost of the material. This, of course, cannot be gainsaid; but it becomes the task of the producers of the steel to educate and instruct potential users of the material along the lines of its ultimate advantages.

Better appearance, lighter weight, greater strength, ease of cleaning, complete absence of corrosive effect —these and other characteristics in the long run will outweigh the objection to initial cost of the steel.

Furthermore, in some instances, such as in the construction of tanks and vats where a continuity of surface is possible, the less expensive stainless clad steel can be used with economy. The latter material is a mild carbon steel to which is bonded a layer of the rust-resisting chrome-nickel steel.

Application of stainless steel is not confined to the manufacturing end of the brewing industry, but finds equal opportunities in the bottling and dispensing operations. The bottle house of the average brewery includes bottle soakers, washers, fillers, crowners, pasteurizers and labelers as well as miscellaneous conveyors, all of which are potential outlets for rustless steel parts in varying amounts.

Bishop & Babcock Co., Cleveland, for the past several years has been redesigning and perfecting bottle filling equipment. An accompanying illustration shows the latest development in this line, a 34-spout low-pressure filler, capable of filling 120 pint bottles per minute. Simplicity, durability, high capacity, low operating cost and sanitation have been the chief aims in construction of this new equipment. The filler tank at the top of the unit is a large iron casting, lined with glass enamel.

At a comparable cost, stainless clad steel might have been used for this tank, with the attendant advantages mentioned previously of light weight, easier cleaning, etc. Engineers of this company, when asked why stainless steel was not used more extensively in their equipment, declared that high cost and difficulty of fabrication militated against the choice of this material.

However, this company is using polished rustless steel in the manufacture of dispensing equipment, cooling coils, novelty boxes, etc. In this field await further opportunities for steel. One engineer foresees polished stainless steel embodied into bars, bar fixtures, back bars, sinks and drains, and even the demise of the old "brass rail" in favor of steel.

BOOKS WORTH READING

Tiemann's Handbook Appears In Its Third Edition

Iron and Steel, by Hugh P. Tiemann; imitation leather, 590 pages, 4 x 7 inches; published by the McGraw-Hill Book Co. Inc.; supplied by STEEL, Cleveland, for $4 plus 15 cents postage; in Europe by the Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This is the third edition of a volume which in general is a combination of a dictionary, encyclopedia and handbook covering iron and steel, allied industries and sciences. The wide variety of terms, designations and abbreviations employed in these industries are arranged alphabetically. As the author indicates, the definitions and descriptions of isolated terms and processes are found under the respective headings, while those employed in connection with some special subject or process are found under the latter, reference being made, as a rule, by page numbers instead of by titles.

Outlines Ferrous Metallurgy

For the benefit of those little versed in the metallurgy of iron and steel and who may desire a guide for a more sequential study than that provided by the alphabetical arrangement, a brief outline of the metallurgy of iron and steel has been included.

Two revisions from the original text, first presented in 1910, have permitted the author to broaden the field of the encyclopedia until it represents an exceptionally complete work. This edition includes information on the marked advances made in chemistry during the past decade, progress in metallography, new alloys, development and use of stainless steels and heat resisting steels, nitriding, new types of mills and other equipment.

◆

World Production Data in League of Nations Book

Review of World Production, 1925-1931, 166 pages, 8 x 10½ inches; published by the League of Nations, Geneva, Switzerland; supplied by STEEL, Cleveland, for $1.25, plus 15 cents for postage.

This volume is a continuation of the memoranda on production and trade first issued in 1927 by the World Economic Conference, with four successive editions. The present title was adopted to avoid confusion with other publications by the conference.

Its scope has been widened to include not only the relative price movements of raw and manufactured products but also the general course of wholesale commodity prices in typical countries, the behavior of individual commodity prices on world markets and shifts in price relationships of significant commodity groups in the course of the depression.

A summary of the main conclusions that may be drawn from the present study has been placed in the introductory chapter.

◆

Molybdenum-Iron Data Are Put into Single Volume

Alloys of Iron and Molybdenum, by J. L. Gregg; cloth, 507 pages, 6 x 9 inches; published for Engineering Foundation by McGraw-Hill Book Co. Inc., New York; supplied by STEEL, Cleveland, for $6, plus 15 cents for postage; in Europe by Penton Publish-

(*Please turn to Page* 63)

Wire Rope Sockets Are Drop Forged to Finished Size

By T. J. BLACK, Production Manager
Canton Drop Forging & Mfg. Co.

AMONG the minor parts of suspension-type bridges are the rope sockets employed to anchor the wire cable at designated points throughout the structures. These sockets are made in a wide range of sizes, depending upon the size of rope for which they are intended, and are of two types, open and closed, varying in design to conform with the method of anchoring.

Responsibility placed on these sockets necessitates that they be steel forgings, although early in their manufacture, when requirements were small, it was not uncommon to machine them from solid bars or to produce them by the now antiquated blacksmith method. Forgings of this type proved unsatisfactory especially from the cost standpoint, and in both cases an exorbitant amount of machine work was required.

As requirements for these sockets increased and justified substantial investment in die and tool equipment, wide interest was created in developing a method of producing them by forging, the method to be in keeping with good forging practice and at the same time to reduce to a minimum the amount of subsequent machining. With extremely large sizes and intricate designs to be dealt with, this presented no small problem.

Machining Is Avoided

One of the pioneers in this work, the Canton Drop Forging & Mfg. Co., Canton, O., has been successful in developing a method by which these sockets are forged entirely to specified finished dimensions and the only machining required is the drilling and reaming of the eye sections for exacting pin fits and the cutting of lead grooves. In addition to effecting this saving in machine work, the compay has directed attention to proper flow lines and thorough working of the metal from correct temperature, considerations which are important in providing greater reliability of the forgings in service.

Production starts with a billet or bar of proportional size to the finished piece. This is broken down and shaped and the long tapered hole started in one or more preliminary hammer or upset operations, the number of preliminary operations depending upon the size of the forging. The shaped piece then is transferred to the finishing hammer where forging is practically completed, with the exception of finishing the long tapered hole and a few other dimensions, which are driven home in large press equipment. Next the piece is coined or sized to exact dimensions, eliminating all machine work except as previously mentioned.

The flexibility of this method appears outstanding when it is considered that it can be applied to the wide range of sizes varying from the smallest made to accommodate ¼-inch cable and weighing 1 pound ready for shipment up to the largest size to accommodate 2⅞-inch cable and weighing 122 pounds finished. These two extreme sizes of sockets are shown in the accompanying illustration.

Properties Are Similar

While the open and closed types vary in tool equipment required and slightly as to the method of fabrication, the ultimate results as to machine work eliminated and in flow lines and proper working of the metal are parallel.

Material employed in the production of the sockets is commonly of the S. A. E. 1040 analysis, being selected with extreme care at the mill and subjected to rigid microscopic and surface inspection. Heat treatment generally is applied to meet phycial properties in accordance with A. S. T. M. specifications A-18-30 Class E, although this treatment can be varied within limits to meet various desired properties.

Because of the small amount of machining required, this usually is performed by the forging company and is considered as a part of the forging specification. Likewise, the pins required in connection with the open sockets are furnished and assembled by the manufacturer, thus assuring accurate fits and satisfactory assemblies. Finally, and just prior to shipment, the forgings are pickled thoroughly and inspected rigidly for minor defects, being checked with gages and templets in accordance with blueprint specifications. Thus, the manufacturer delivers to the customer a completed socket ready for insertion of the cable and pouring of the lead.

Open and closed types of wire rope sockets, produced as drop forgings practically ready for assembly. The small closed-type socket, at the lower left, is made for ¼-inch cable and weighs 1 pound finished; the large open socket is for 2⅞-inch cable and weighs 122 pounds

Experiments with Chromium Steel for Dental Use

Chromium steel as a substitute for gold dentures was demonstrated before dentists recently at the annual clinic of the Toronto Academy of Dentistry, Toronto, Ont.

Dentists have been experimenting with chromium steel for several years. As a material, steel is much less costly than gold. It possesses all the attributes of gold and has the added advantage of being stronger. It can be used in thinner layers than gold in upper plates of dentures and makes more delicate appliances than does gold in bridges, and the like.

The outstanding difficulty at the present time lies in the manipulation of steel, for chromium steel is harder to handle than gold; however, methods for its use are now being worked upon. At present the work on a chromium steel denture brings its cost up to that of gold, but it is expected that it will soon be possible to cut down the work and give the public the advantage of the steel at less cost than gold.

IMPROVING OPEN-HEARTH FURNACE DESIGN

BY WILLIAM C. BUELL JR.

Part V—Open-Hearth Furnace Lines

(Twenty-Fifth Article of Series)

LINES of an open-hearth furnace include the contour or profile longitudinally either in elevation or plan, or the perimeter of the transverse sections of the inner surface of the furnace brickwork above the foreplate line, and in linear distance extend from end to end of the furnace and include the upper terminals of the uptake (or downtake) ducts. Excepting that the design of the roof at the ends to the knuckles, and the monkey walls roughly conform to two general styles of contour dependent, in a measure, on the fuel used, the contour and profile of the furnace interior usually is developed from judgment or artistry rather than from sound analytical technology.

As a result of prejudice this method of development probably will continue in use although the lines may be designed exactly by the use of thermophysical mathematical methods applied with an understanding tolerance of the requirements and limitations of the process of basic steel manufacture.

Designs Are Presented

The sections of the 16 furnaces under discussion in the treatise are given in the several sections of Fig. 43. The upper or sectional elevations are presumed to show the profile of the furnace roofs through the furnace center or at maximum height. At the left the sections below the roof are on the furnace center line and bisect the fuel inlet port. At the right, the section is presumed to sever the brickwork through the air duct on the near or charging side of the furnace. The line on which the entire section below the roof is taken is shown on each of the plan views.

The lower or plan view is presumed to be taken as follows: at the left the section is horizontally through the fuel inlet port in order to show the design of this component. Over the hearth the section is through the front wall at the doors and the back wall just below the skewback brick, thus indicating the maximum hearth or laboratory width, and at the right the section is taken above the fuel port. The section line shown in connection with the upper elevational view indicates the horizontal location of this section. The figures of the bath give its length, width and depth respectively, while those immediately following are the area in square feet, the volume in cubic feet and the nominal or fair capacity of molten steel in gross ton. These latter figures are based on a graphic method of computation that will be explained later.

Brief synopses of the history of each of the furnaces shown follow:

Furnace A: One of six similar furnaces in a 12-furnace plant. Originally built as 90 to 100 tons capacity it later was rebuilt to 150 tons rating. These are probably the first 150-ton stationary furnaces built in this country. They have been in operation at the higher rating for several years. Producer gas is fired through Blair ports. Waste-heat boilers are used.

The tonnage capacity as mentioned in these synopses is that assigned by the operating officials of the plant in which the furnaces are used. Usually arbitrarily established, they are actually of little value as a mark of furnace performance other than to indicate the tonnage of molten steel a furnace is expected to hold.

Furnace B: One of four similar furnaces in an eight-furnace plant.

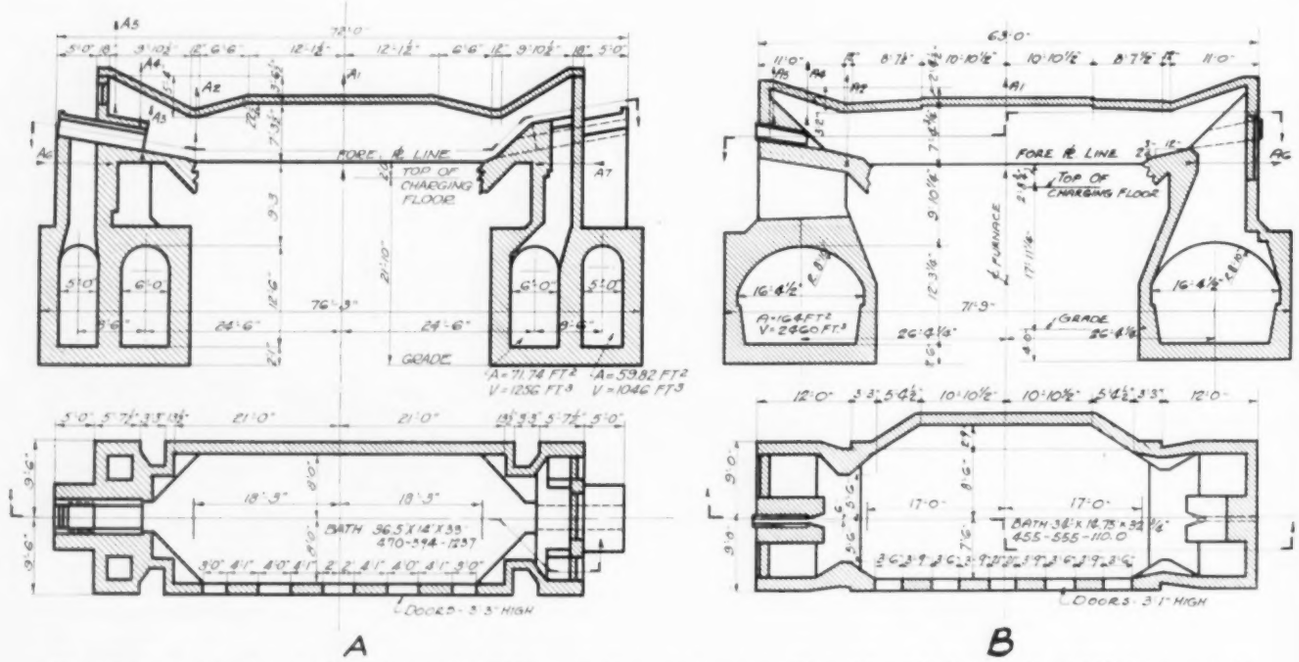


Fig. 43A—Sectional and plan views of a 150-ton stationary furnace. Fig. 43B—Oil fired unit of 100 tons capacity

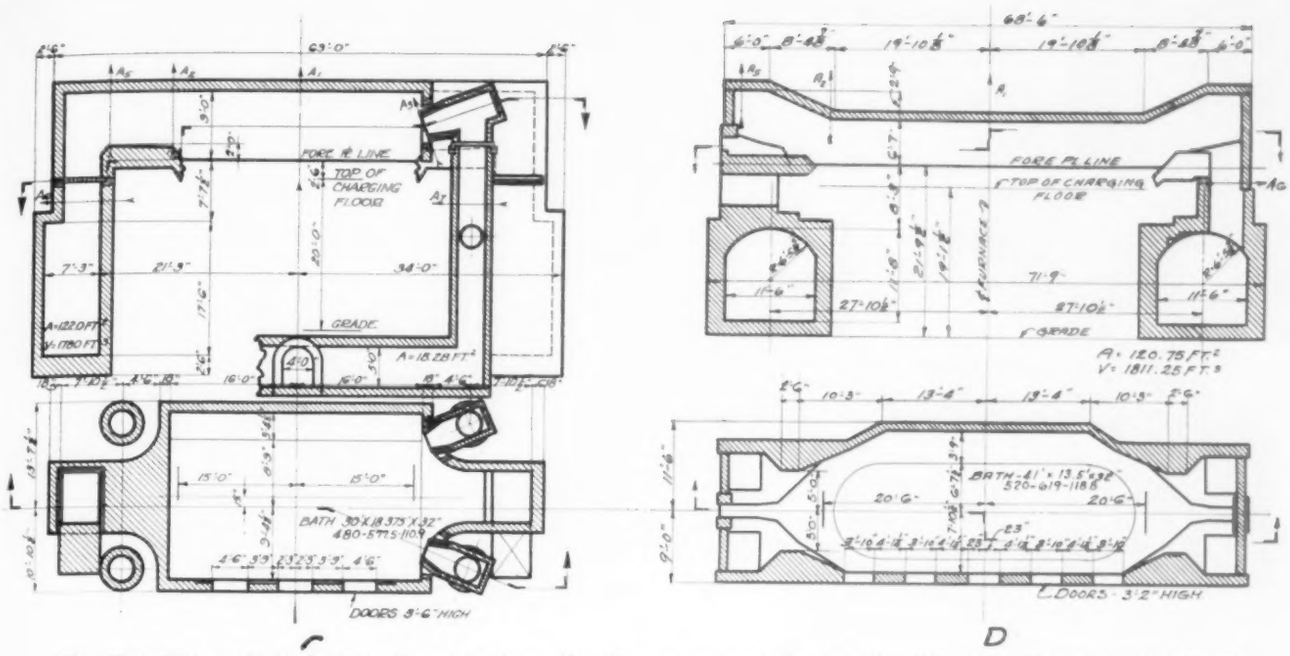


Fig. 43C—This unit is fired continuously from the four corners of the hearth. Fig. 43D—Forced draft furnace

Originally built to tap about 70 tons, it was enlarged and generally rebuilt in 1929 to include the Isley system and now is rated as 100 tons capacity. It is fired with oil, end injection and largely is used to produce ingot iron which on account of high temperature of operation and added length of refining time react unfavorably against a favorable comparative performance record of this unit.

Furnace C: This furnace shows the McKee-Tonnar open-hearth furnace design which fires continuously from the four corners of the hearth. This unit is included as an example of a trend of new thought in open-hearth design and operation. As no actual operating figures are available later analysis is based on assumed data.

Furnace D: One of 12 similar furnaces in a 14-furnace plant. Originally built as 70-ton furnaces were enlarged and rebuilt in 1929 to 100 tons rated capacity. Fuel, coke oven gas with injection of the fuel through the end walls. This furnace employs forced draft and incorporates waste-heat boilers.

Furnace E: This example is from an eight-furnace plant built in 1928, all furnaces being rated at 125 tons. Oil is the fuel injected through the end wall and a waste-heat boiler is used.

Furnace F: A unit of a four-furnace plant built in 1929 with all furnaces similar and rated at 150 tons. These furnaces are unusual as examples of late design owing to the length and narrowness of the hearth and the absence of sloping back walls.

Furnace G: This is the largest and newest unit of a 13-furnace plant. It was built in 1929 and is rated at 130 tons capacity. The McKune system of firing utilizing forced draft and sliding dampers in the air uptakes is employed. The furnace is fired with mixed coke oven-blast furnace gas injected at the bottom of the air stream as it flows horizontally through the throat, without regeneration of the fuel and is the outstanding American example of nonluminous flame operation.

Furnace H: A unit of a 13-furnace

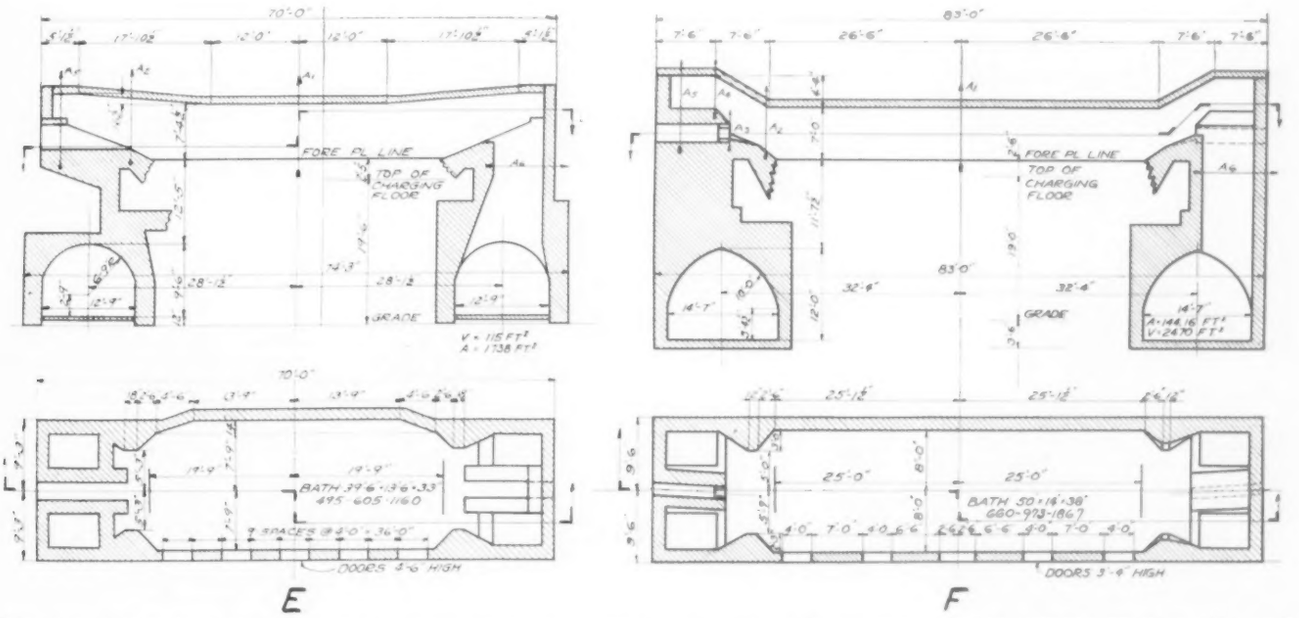
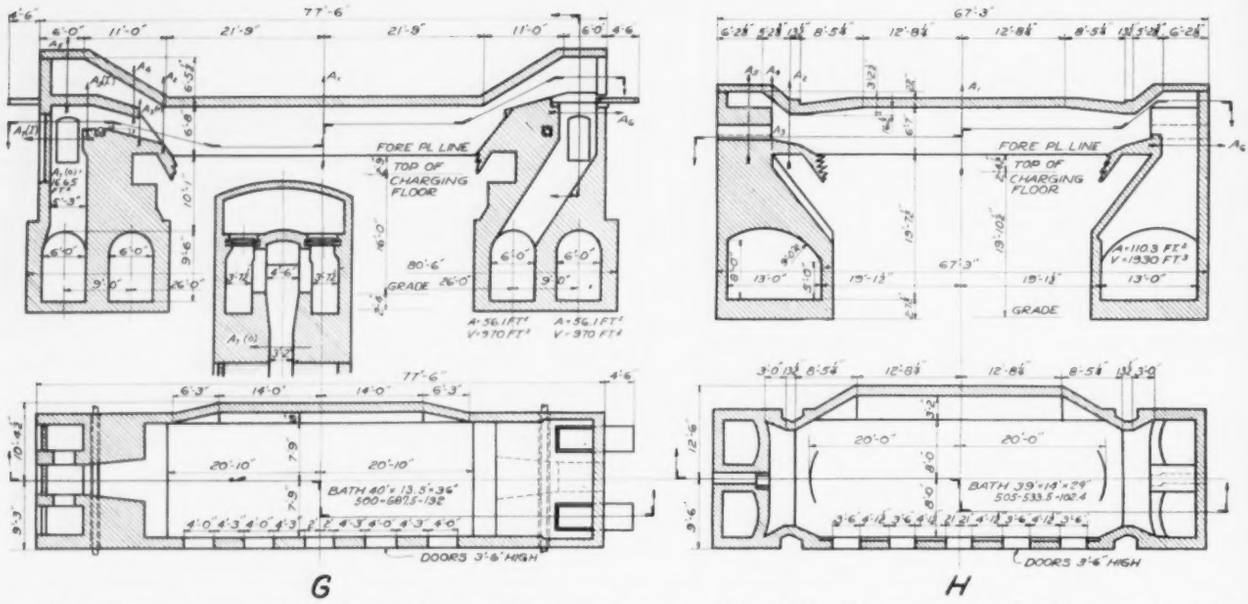


Fig. 43E—Unit fired with fuel oil injected through the end wall. Fig. 43F—Narrow hearth furnace rated at 150 tons



G H

Fig. 43G—Furnace fired with mixed coke oven-blast furnace gas. Fig. 43H—120-ton unit fired with by-product tar

plant, all furnaces being essentially similar. It was erected in 1927. By-product tar is the fuel with end injection. The furnace is rated at 120 tons capacity.

Furnace I: One of a six-furnace installation, all of the same size, constructed in 1930. The rating is 150 tons. The furnaces were designed primarily for producer gas firing with oil auxiliary.

On account of economic conditions in the fuel market, oil is the only fuel that has been used. Waste-heat boilers are installed. Many competent critics believe this to be the finest installation in the United States.

Furnace J: A unit of a 14-furnace plant erected in 1930, all furnaces being similar as to capacity and design. The capacity rating is 150 tons. The furnaces have venturi ports and are arranged for producer gas firing with coke oven-blast furnace gas auxiliaries. Waste-heat boilers are employed.

(To be continued)

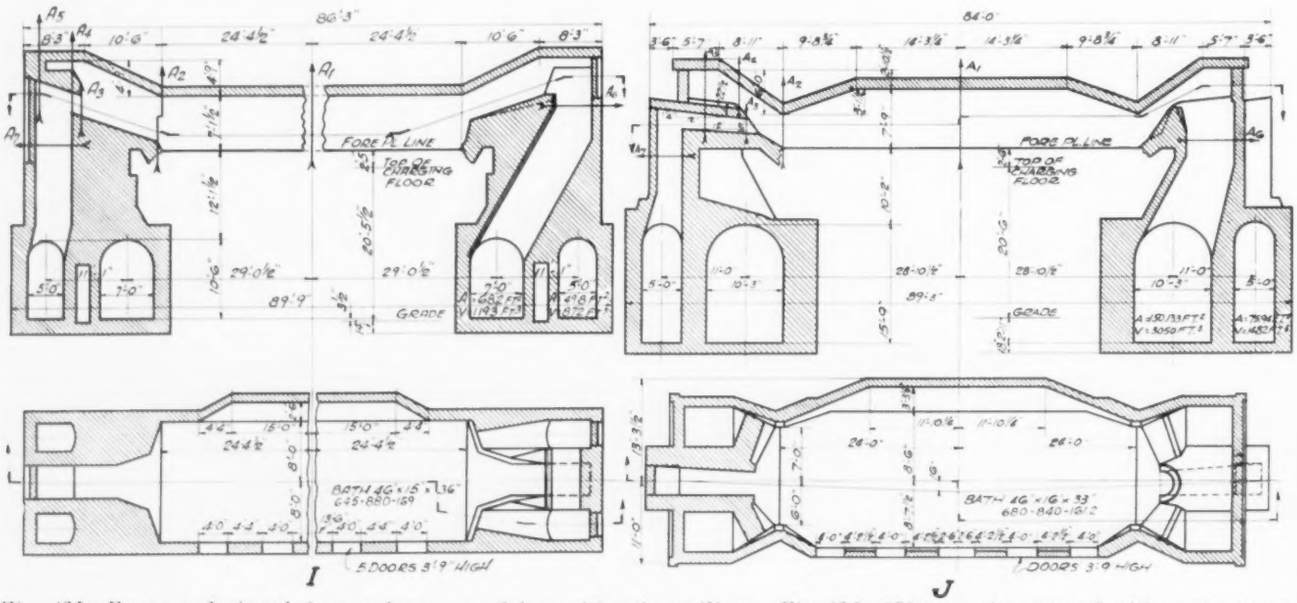
Develops Simple Process For Coloring Aluminum

A process for oxidizing and coloring aluminum and its alloys is now being marketed by the United States Research Corp., 40 Twenty-first street, Long Island City, N. Y., under the name Coloral.

The company states that the process, developed by Colin G. Fink and L. C. Pan of the technical staff, has been in commercial use for about three years; that it has proved efficient, economical and reproducable in the average plating shop. No special equipment is needed, the work involving only two steps—an electrochemical oxidizing treatment in a special bath which produces a hard, nontarnishing, noncorrodable and nonporous finish; and subsequent immersion in the coloring bath which penetrates the hardened oxidized surface and produces a fast, permanent color. The complete cycle requires about 30 minutes.

The company's interest lies solely in the sale of electrolyte for the bath and coloring material, no royalty being involved for use of the process. A booklet has been prepared describing the process in detail and showing samples of colored aluminum.

Ontario hydro-electric power commission, Toronto, Ont., will install 50,000 heaters free in homes in Ontario to create a market for surplus electrical engineering.



I J

Fig. 43I—Furnace designed for producer gas firing with oil auxiliary. Fig. 43J—150-ton unit equipped with venturi ports

"IT'S THE MAIN SHAFT . . . THE WHOLE MILL IS DOWN!"*

A broken shaft . . . men idle . . . production halted. A call to the J & L warehouse. Yes . . . today. No freight service . . . must go . . . but how? The steel shafting went that day *on a passenger train.* Your J & L Warehouse has what you want . . . not almost, but exactly . . . and can get it to you promptly, despite obstacles. Its personnel is composed of trained steel men with the ability and desire to serve you intelligently. Write for a copy of the J & L Combined Stock List. The thousands of items listed await your call in any quantity. Steel users, both large and small, find J & L Warehouse Service efficient.

* An actual experience from our sales records.

AND BE SURE . .

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Making the Most of

METHODS AND MATERIALS

DIRECT investigations of unevenness of metal surfaces have been made by means of a needle. Its point travels over the unevennesses and the resulting displacements are either projected to an enlarged scale on a screen, or recorded on a moving strip of photographic paper by a beam of light reflected by a small mirror connected with the needle. Phonograph needles are used frequently and the diameter of their points, averaging about 0.0025 inch, determines the depth to which the point will go down into the valleys of the minute unevennesses. When it does not reach the bottom, the profile curve recorded becomes shallower than it should. This difficulty has been overcome by a German investigator in an ingenious manner. A copper amalgam cast of the surface is made and a profile curve of this cast is recorded with the same needle. The valleys of the original surface become the peaks of the cast, and these can be recorded without error. A combination of the two curves thus obtained gives the true profile of the original surface.

S S S

The inside of electric lamp bulbs is being etched in France by a machine which squirts hydrofluoric acid into the bulb through a nozzle. Because these nozzles had to be replaced frequently due to the acid's corrosive action, they are now being made of a nickel-copper-chromium cast iron which withstands the acid attack.

S S S

DESIGNERS of knitting machinery are considering the use of stainless steel for needles and other parts. It is considered that this type of steel has an important future in this industry for the reason that in the humid atmosphere of knitting plants there is a considerable deterioration of machine parts, needles, and other accessories, due to rust. Furthermore, there is considerable trouble due to rust stains on the yarns. It is believed that with stainless steel parts the humidity in knitting mills could be increased without consequent deterioration of machine parts.

S S S

Use of nickel steels in the petroleum industry is growing. These alloys are now almost universally used in drilling equipment, where high strength with toughness is required, and their use in applications connected with refining is expanding. As an example, two important oil companies have adopted nickel steel specifications for valve service.

S S S

It has long been contended that while the oxyacetylene process is the only practical blowpipe method for welding aluminum of thicknesses above ⅛ inch certain fuel gases other than acetylene should be employed on lighter gages. An investigation made by a leading fabricator

of welded aluminum products is said to have disproved this contention and demonstrated the efficiency of oxyacetylene. This investigation, it is reported, showed a 30 per cent saving in production costs and in some cases a 47 per cent saving could be accomplished by using the oxyacetylene flame.

S S S

A foundryman discovered that his gray iron castings were rusting in certain definite areas on both faces and these same areas would rust again in identically the same places if the castings were reblasted. This rusting caused considerable popping and blistering in porcelain enameling. After an exhaustive series of tests, the conclusion was reached that the water used to dampen the mold sand was impure, containing large amounts of calcium chloride. The material deposited itself on the iron and being deliquescent it absorbed water and rusted the iron when the air was moist or the atmosphere humid.

S S S

The impression cylinder in one of the large presses of an eastern printing concern wore out by devloping hollows in its surface. Ordinarily, this would necessitate a new cylinder, but the loss was avoided by building it up with sprayed molten metal. The cylinder was sprayed with high-carbon steel and then ground to size. The work was accomplished within four days, whereas to have replaced the cylinder would have required about a month. Cost of the metal spraying was less than half the cost of a new cylinder.

S S S

A TENTATIVE design for a 75-foot transmission tower recently showed that whereas this tower would weigh 15 tons if built of plain carbon steel, it could be built of 3 tons of cold-rolled corrosion-resisting steel, and still have the dimensions and same strength. The total cost in corrosion-resisting steel, it was estimated, was about twice that of a plain carbon steel structure. At the same time, it was figured that the initial expense would be counterbalanced by the lack of maintenance expense and by the longer life resulting from the use of corrosion-resisting steel.

S S S

Steel, when heat treated to a strength of over 150,000 pounds per square inch, is lighter as a structural material than duralumin and other aluminum alloys.

S S S

A light-sensitive control, recently placed on the market by a large electrical equipment manufacturer, provides a rugged industrial aid which can be actuated by a phototube or by delicate contacts carrying only a few microamperes. The phototube or sensitive contact operates a sturdy grid-glow tube directly, which in turn closes a contactor capable of initiating any desired operation. Thus, delicate intermediate relays are eliminated and greater reliability is obtained.

"We have to act and act fast if we are going to make any money this year. What do you think?"

"Just this. We *can* make a profit on our present volume. We *can't* wait for business to get better or we won't be in business when it does. We *can* make money in 1933 if we revamp our production methods ond our product to meet 1933 markets."

"Even suppose we redesign the rest of the line for arc-welded construction. People aren't buying."

"Wrong. People are buying . . . although not in the same quantities as a few years ago. If we are going to get our share of this business and make a profit we have to adopt modern methods. Advancements in welding have increased the speeds and improved the quality to a point undreamed of when we started to weld.

"Lincoln has guaranteed to lower our production costs through the use of the 'Shield Arc' welder and the shielded arc process of welding. They even gave us figures on the actual cost per foot of weld.

"Here's a real saving that will enable us to realize a fair profit, and to pay for the machines themselves. Read this three-way guarantee of the Lincoln 'Shield Arc' performance:

1. More weld metal deposit per K.W.H.
2. Faster welding per K.W.H.
3. Lower cost per unit of welding—the unit being per lineal foot of weld, or per pound of weld metal, or per hour of welding.

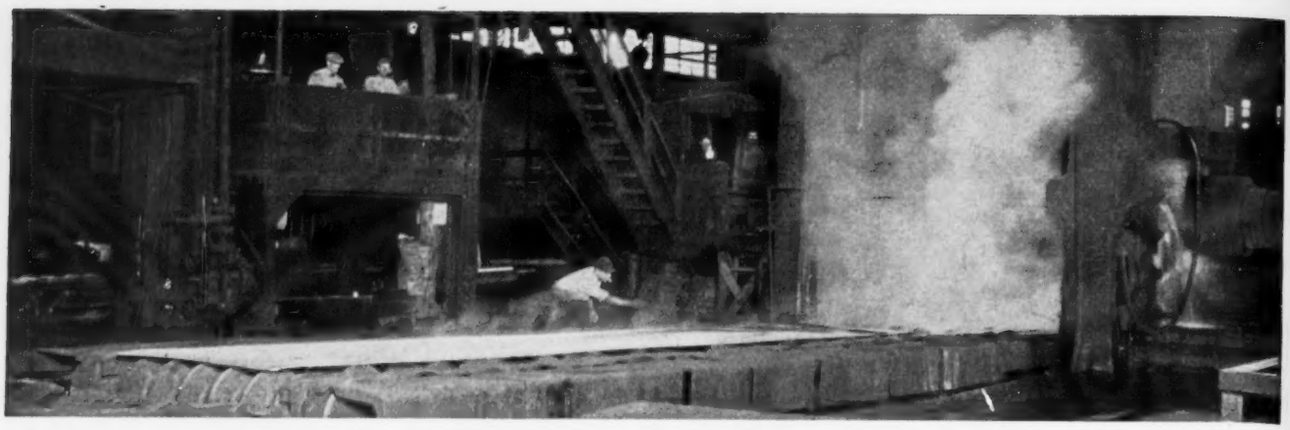
"Then let's get ahead by giving the go-ahead on that order to

LINCOLN

THE LINCOLN ELECTRIC COMPANY, CLEVELAND, OHIO

Largest Manufacturers of Arc Welding Equipment in the World

W-35



PROGRESS IN STEELMAKING

TRANSFERRING heated ingots from the soaking pits to the blooming mill approach table is being accomplished at a mill in the Pittsburgh district by a remotely controlled car which is accelerated and decelerated automatically. The car with its load is accelerated to 12 miles an hour in four seconds, is retarded to 2 miles an hour upon approaching the stopping point and is spotted within 6 inches of the desired destination where an electrically-driven pusher moves the ingot onto the approach table.

♦ ♦ ♦

Pitchers of various capacities for transferring concentrated acid from storage tanks or carboys to pickling vats now are being fabricated of 18-8 alloy sheets by a company in the Pittsburgh district. Joining is accomplished by welding.

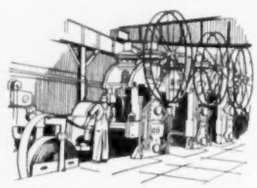
♦ ♦ ♦

Stationary knives used for hot shearing rounds and squares stay in service longer when coated with a layer of heat and abrasive-resisting alloy. Tests show an average output of 1500 kegs of 1⅛-inch square nuts with blades thus treated compared with an average production of 100 kegs with regular steel knives.

HYDRAULIC rams operated with oil are incorporated in a recently developed full-hydraulic stoker for boiler plants at blast furnaces and steelworks. Crankshafts, gears, power boxes, couplings and shearing pins have been eliminated from the design. The hydraulic pump, which serves the rams, also controls the ash crushing rolls and stoker. Breakage of parts is minimized, inasmuch as any obstruction automatically results in a pressure which in turn decreases the stroke of rams until the obstacle is dislodged.

♦ ♦ ♦

Stainless steel tubes with a high polish on the interior now are being made up to 28 feet long.



ROLL pressure on a 4-high mill installed in a middle western plant are measured and recorded by what is claimed to be the first built-in application of telemeters. The instruments employed on this mill are of the carbon-resistor type and are based on the principle that the electrical resistance of carbon contacts varies with the pressure. Six carbon piles each consisting of 50 disks about the size of a dime are mounted in pairs, at intervals of 120 degrees, on the periphery of a round steel plug. One of the units is installed at each end of the mill between the screw and bearing housing. The continual change in electrical resistance of the carbon piles is measured by a Wheatstone bridge circuit and indicated by a recording instrument on a chart calibrated to show the fluctuations of the rolling pressure in pounds.

♦ ♦ ♦

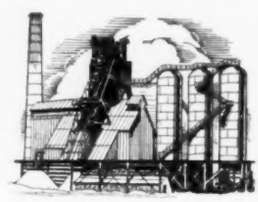
Rough grinding steel mill rolls is best executed by using a traverse speed ranging from 50 to 65 per cent of the width of the abrasive wheel per revolution of the roll, according to an authority on roll grinding. A maximum of ¼-inch per revolution of the roll is satisfactory for finishing. The final finish is imparted best by maintaining the traverse speed at the minimum rate

♦ ♦ ♦

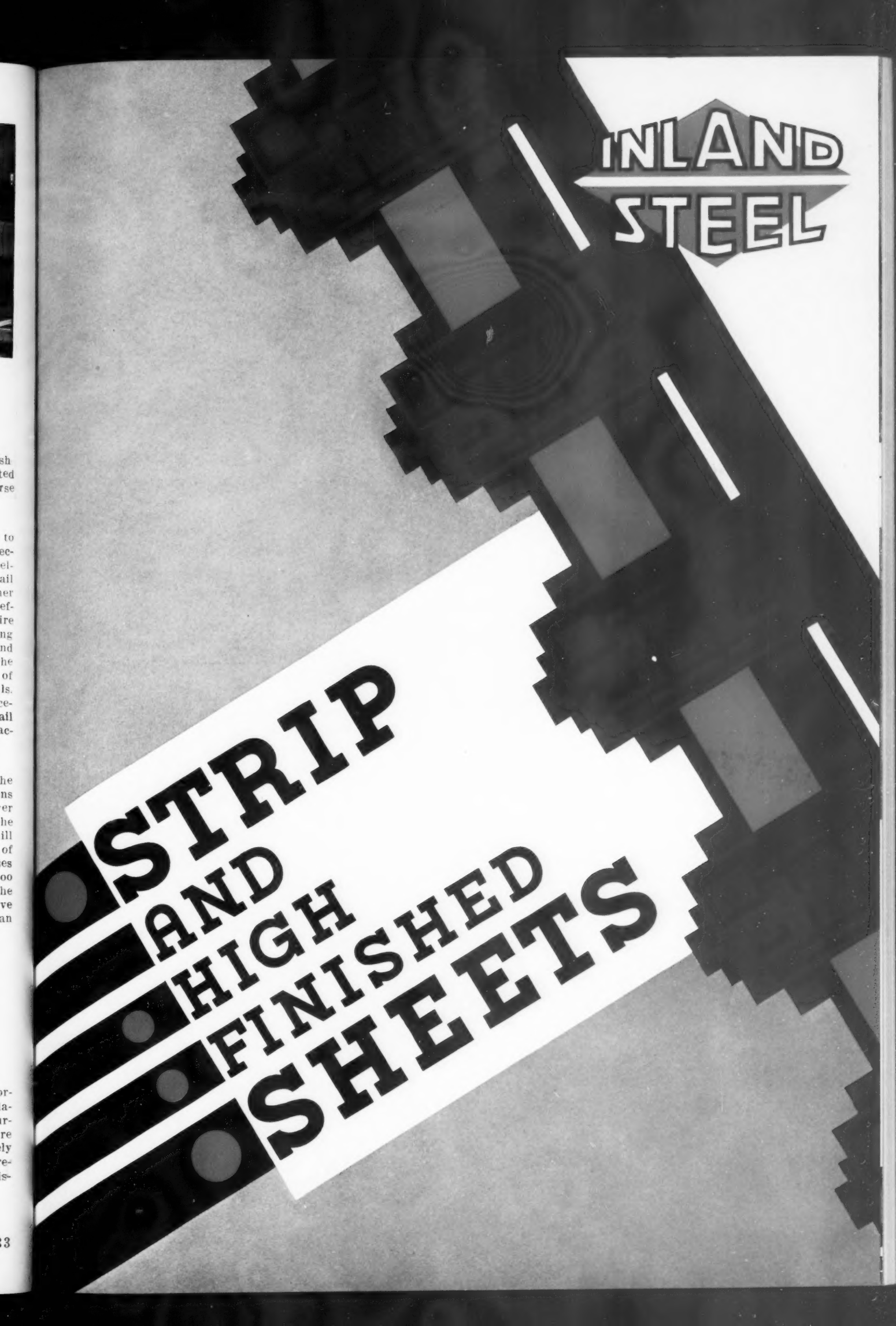
Use of a standard rubber tire to drive on the bottom of the rail section is a feature of a recently developed electrically-driven monorail trolley for use in pickling and other steel mill departments. High coefficient of friction between the tire and steel rail provides a nonslipping grip. Rail wear is eliminated and control problems simplified. The new type of drive permits the use of power travel on narrow flange rails. Wear now occurs only on the replaceable tire. Peening down of the rail flanges under the driven wheel action also is eliminated.

♦ ♦ ♦

Complex shapes involved in the development of new steel sections frequently lead to excessive power requirements in rolling and in the production of stickers and mill cobbles. Too large a percentage of reduction in the particular passes where the difficulty occurs, or too much change in the contour of the roll pass usually causes the excessive energy requirement, according to an official of a Pennsylvania plant.

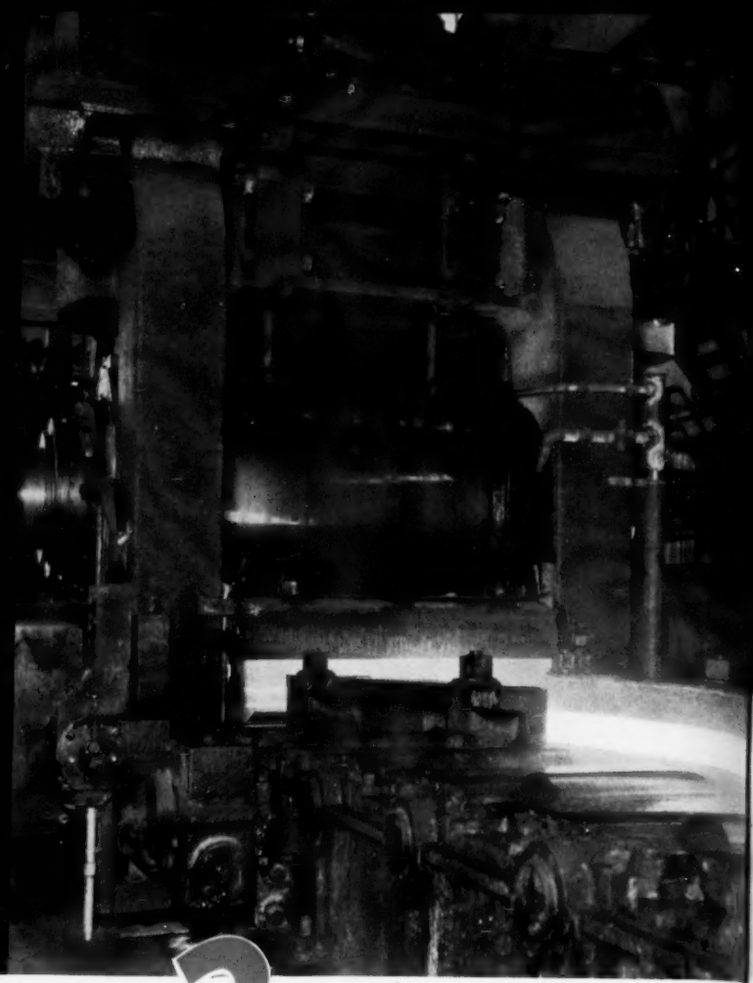


SPHEROIDAL-SHAPED refractories now are available for installation in old checker flues of blast furnaces stoves where existing areas are wastefully large for the use of finely clean gas. Inserts of this type refractory are possible without the dismantling of old checkers.


INLAND
STEEL
STRIP
AND
HIGH
FINISHED
SHEETS

1

Front view of one of the three slab reheating furnaces serving the new continuous sheet and strip mill.



2

Close-up of a four-high roughing mill-stan —one of four.

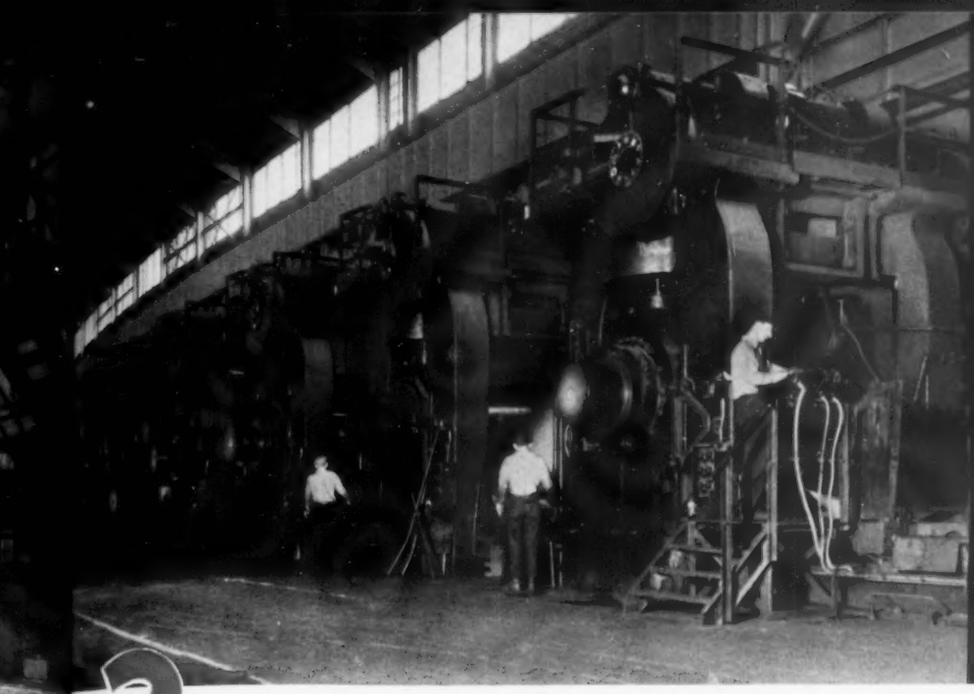
INLAND-the Logical Source

THE MILL

Inland's New Co tinuous Strip and She Mill is the result of long study by leaders in the art of ste making and the design of steel rolling equipment. It the high point in the perfection of fast, accurate, ec nomical, reliable rolling equipment.

What advantage to you as a steel buyer? Quality. Servic For the better the equipment, the more certain the qualit of your finished steel, the more certain the service which you can rely, the more certain you can be th your exact specifications can be met—especially if th are difficult.

Secure these advantages on Hot and Cold Rolled Str and Sheets—including Auto Body, Furniture and all othe High Finished grades.



3 *Close-up of the six huge four-high finishing stands.*

4 *A section of the runout tables.*

Panoramic view of the hot mills, looking from reheating furnaces toward the hotbeds.

because of . . .

THE MEN

The finest equipment, the most highly perfected process cannot by themselves meet your exact requirements. Your final security for quality and service is the experienced skill of the Inland Organization—men in the plant, who are experienced and ready for unusual contingencies; in the laboratory, who take nothing for granted; in the metallurgical and sales departments, who can foresee and evaluate the conditions your product will combat.

THE MATERIALS

But neither men nor mill can make good steel without adequate raw materials. And so Inland starts the control of quality at the source. From mining properties and quarries selected for the high uniform quality of their deposits, down through blast furnaces, open hearths, and rolling mills, Inland vigilance never relaxes; nothing is left to chance.

The Mill, the Men, the Materials make Inland the Logical Source, "The Able Servant of the Central West."

ALREADY ••• INLAND COLD ROLLED SHEETS USED IN MANY LEADING PRODUCTS

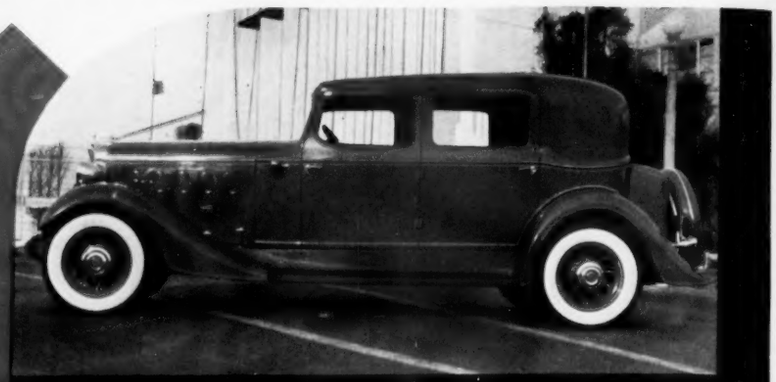
• • • •

USE by leading manufacturers is the best proof of quality. Inland has produced a complete line of High Finished Steel Sheets for approximately one year, but already leading manufacturers of products requiring the sales-appeal of beautiful finishes are using Inland Sheets—many of them exclusively.

The four products shown here are typical of the many applications already made of Inland Furniture, Auto Body, and other high finished Sheets and Strip.

Rely on Inland for your requirements. You can be sure of the uniform quality which only the best of equipment, experienced technical skill, and minute control of raw-material quality can guarantee.

INLAND STEEL COMPANY,
38 S. Dearborn St., Chicago, Ill.



One of many new models incorporating Inland Auto-Body Sheets.

Office walls and furniture of Inland Furniture Sheets.

A modern, designed-for-steel table made of Inland Furniture Sheets.

Typical of one of the many fine finishes secured with Inland Cold Rolled Sheets.

INLAND STEEL

ABLE SERVANT OF THE CENTRAL WEST

Sheets Strip Plates
Bands Structurals Piling

Rails Track Accessories
Bars Rivets Billets

SCANNING THE FIELD OF TECHNOLOGY

A Digest of Important Developments Pertaining to the Production, Processing, Application and Performance of Steel

High-Speed Steels

By Joseph V. Emmons, in Transactions of the American Society for Steel Treating, March, p. 193, 29 pp., 20 ills., 6 tables.

This discussion covers an investigation of the properties and performance of several types of molybdenum high-speed steels. Mechanical properties of hardness, strength and plasticity for each type are presented. Microstructures are studied; cutting qualities determined. Comparisons are made between the molybdenum steels and some well known types of tungsten high-speed steels. A new type of molybdenum high-speed steel is described, containing about one-fourth as much tungsten as molybdenum. It has been found to have many superior properties.

—STEEL, 3-27-33

Electrical Equipment

By J. S. Murray, in Blast Furnace and Steel Plant, February, p. 14, 2 pp., 1 ill.

Large power units, such as turbogenerators, main drive motors, etc., have been idle in some plants for a considerable period, as a result of the industrial depression. This article describes methods for determining definitely the conditions of the insulation resistance of such units before putting them in service; also recommendations are made for preserving or improving present conditions of insulation.

—STEEL, 3-27-33

Oxygen in Electric Steel

By Henry D. Phillips, in The Foundry, March, p. 13, 3½ pp., 2 ills.

During the working of an acid electric heat the steel contains iron oxide which must be eliminated, the quality of the steel depending upon the extent to which it is done. If not enough is removed "wild" steel results, and if too much is removed other undesirable results may become evident. Fluidity in steel is related to the presence of dissolved oxide or suboxide or iron.

—STEEL, 3-27-33

Metals at Low Temperature

By J. B. Johnson and Ture Oberg, in Metals and Alloys, March, p. 25, 5½ pp., 5 ills., 8 charts, 3 tables.

Mechanical properties at low temperature of metals used in aircraft construction. Iron-base, aluminum-base and magnesium-base alloys were investigated by tests in a cold chamber kept at about —40 degrees, representing the temperature at an altitude of about 30,000 feet. Tensile, impact, fatigue and hardness tests were made.

—STEEL, 3-27-33

Molded Plastics Industry

Iron Age, March 2, p. 345, 3 pp., 7 ills.

Business of making plastic products from phenolic resins has grown amazingly in recent years and has been less affected by depressed conditions than other lines. Metalworking plants are urged to investigate this newcomer, because it is a competitor which should not be underestimated and which in many cases actually helps to increase use of metal.

—STEEL, 3-27-33

Welding Stainless

By S. H. Phillips, in Western Machinery and Steel World, February, p. 44, 4 pp., 2 ills.

Welding of stainless steels with special reference to the requirements of heat-resisting service. Preparation of material to be welded, correct conditions for welding, effects of welding on mechanical strength and effects of welding on resistance to corrosion are outlined.

—STEEL, 3-27-33

Metallurgical Coke

By R. A. Mott, in The Iron & Steel Industry (England), February, p. 189, 7 pp., 3 tables.

Discussion of modern investigations of the properties of coke and their influence in metallurgical processes, as applying particular to the British iron and steel industries.

—STEEL, 3-27-33

Etch Pits in Iron

By Dana W. Smith and Robert F. Mehl, in Metals and Alloys, March, p. 31, 2½ pp., 6 ills.

Use of etch pits in Armco iron for the determination of the orientation of iron crystals. Technique involved the use of an aqueous solution of copper-ammonium chloride as an etching reagent.

—STEEL, 3-27-33

Mill Lubrication

By Louis H. Hein, in Blast Furnace and Steel Plant, February, p. 99, 4 pp., 5 ills.

Description of a centralized lubrication system for a 3-high 48-inch universal mill. Included in this plan were 196 bearings. Safety, lower costs, assurance of positive lubrication, cleanliness and prevention of waste are advantages emphasized.

—STEEL, 3-27-33

Nickel-Chromium Iron

By Alan E. W. Smith, in The Iron & Steel Industry (England), February, p. 171, 7 pp., 4 ills., 5 tables.

Summary of research seeking to ascertain how nickel-chromium cast irons are affected by heat treatment and whether the effects noted could be utilized for the development of irons with particular properties.

—STEEL, 3-27-33

Galvanizing Plant

By C. A. Blesch, in Western Machinery and Steel World, February, p. 40, 3 pp., 2 ills.

Description of a Pacific Coast galvanizing plant in which gas firing is employed. Methods are cited for determining in advance the fuel cost for galvanizing on any basis of operation.

—STEEL, 3-27-33

Grinding Strip Steel Rolls

By Edward S. Heck, in Abrasive Industry, April, p. 8, 3 pp., 4 ills.

Outline of grinding procedure involved in obtaining high quality mirror finish on rolls for finishing stainless steel strip.

—STEEL, 3-27-33

Production Welding

By Charles O. Herb, in Machinery, March, p. 433, 4 pp., 7 ills.

Manufacture of domestic oil-burning furnaces, embodying one-piece all-welded steel construction. Each furnace has approximately 2100 inches of welded joints. With a production of 225 furnaces per week, this means that almost 500,000 inches of welding are accomplished in that time. From 40 to 45 per cent of the welding is done automatically or semiautomatically, the balance by hand. Atomic hydrogen welding is used on the more important internal joints.

—STEEL, 3-27-33

Steel Castings

By William M. Sheehan, in Railway Purchases and Stores, March, p. 83, 4 pp., 5 ills.

Railroads alone consume over one-third of the country's output of steel castings; therefore railroad prosperity is vital to producers of steel castings. Applications of cast steel to various car and locomotive parts are discussed. Crying need for replacement and modernization of present equipment is cited.

—STEEL, 3-27-33

NEW EQUIPMENT

PRODUCTION FABRICATION TREATMENT FINISHING

Pumps Are Rotary Radial Piston Type

Northern Pump Co., Minneapolis, recently introduced a complete line of hydraulic pumps and motors of the rotary radial piston type. The units, shown herewith, are available in sizes from 1 gallon per minute to 200 gallons per minute, and pressures of 4000 pounds per square inch, pumping oil for hydraulic systems. Volume of discharge can be changed to deliver any amount from zero to the maximum capacity of the pump, and discharge can be reversed without stopping the pump or changing speed of rotation.

All pumps are fitted throughout with nitralloy and incorporate a balanced pressure design to prevent heavy bearing loads at high pressures. A complete line of automatic controls and semiautomatic valve mechanisms is available for use with the pumps. Among applications where hydraulic pumps are standard equipment are: steel billet shears, furnace chargers, sheet and rod stretchers, continuous furnace pushers, cold saw feeds, grinders, presses, winches, planers, etc.

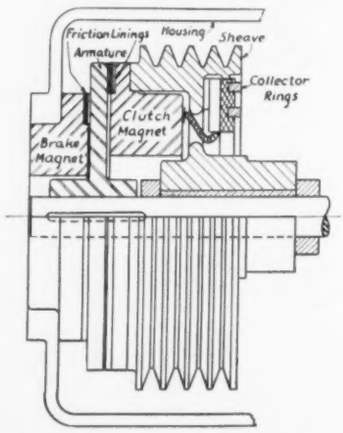
Northern hydraulic pump available in wide range of sizes

◆

Unit Combines Magnetic Clutch and Brake

Magnetic Mfg. Co., Milwaukee, recently developed a combination magnetic clutch and brake unit, shown herewith. The magnetic clutch on the dual purpose unit is 10 inches in diameter and has a torque rating of 1000 inch pounds. It is mounted inside the driven sheave which idles on the shaft.

The magnetic brake is 8 inches in diameter with a torque rating of 350 inch pounds, and is mounted in a fixed position in the housing of the spindle gear box. To conserve space the collector rings are mounted within the sheave. The armature is slidably keyed to the shaft and is used for both clutching and braking. The device provides both clutch and brake action for motor driven spindles on machine tools. Belt shifting and manual stopping are eliminated and accurate control of the machine is maintained easily when equipped with this unit.



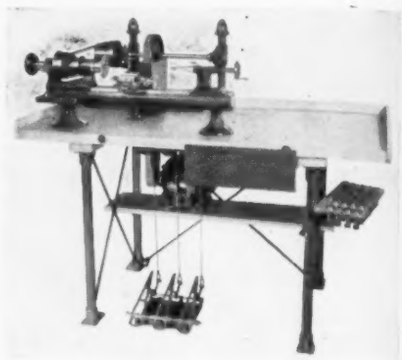
Combined clutch and brake built by Magnetic Mfg. Co.

◆

Develops Six-Speed Motor Driving Unit

Hardinge Bros. Inc., Elmira, N. Y., is introducing a six-speed motor drive unit designed to eliminate gears, clutches and loose pulleys, and by the use of endless belts to prevent noise, chatter and vibration. This method of drive, shown herewith, is applicable to bench lathes, hand screw machines and milling machines. Six forward and six reverse speeds are obtained by the application of a standard two-speed reversible motor. The motor speeds are controlled instantly by patented self-locking foot treadles.

Motor controls are mounted on a panel underneath and toward the rear of the bench. Standard equipment includes bench complete; 220-volt, 60-cycle 3-phase two-speed reversible motor; controls for motor; treadles; steel drawer; collet board; shelf for motor; drive shaft; endless belts and pulleys.

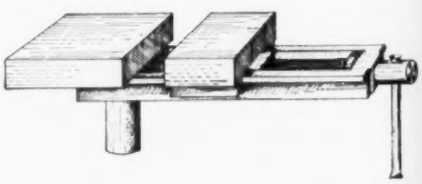


Six-speed motor drive unit developed by Hardinge Bros. Inc.

◆

Drill Table and Vise Built In Three Sizes

Modern Machine Tool Co., Jackson, Mich., has placed on the market a new all-steel combination drill table and vise which performs the same functions as the larger models that have been available for a number of years. The device, shown in the accompanying illustration, is designed primarily for the smaller shop and is sturdily constructed of plates and angles, welded and accurately machined. This new tool is available in three sizes, with 6, 7 and 8-inch square tables that open from 4 to 4½ inches. All vises are 1-inch deep.



Drill table and vise marketed by Modern Machine Tool Co.

◆

Radiation Tube, Recorder Meet Industrial Requirements

Pyrometer Instrument Co., 103 Lafayette street, New York, recently de-

For Easier, Faster and More Economical Die Sinking....

Use These Norton Mounted Wheels and Mounted Points

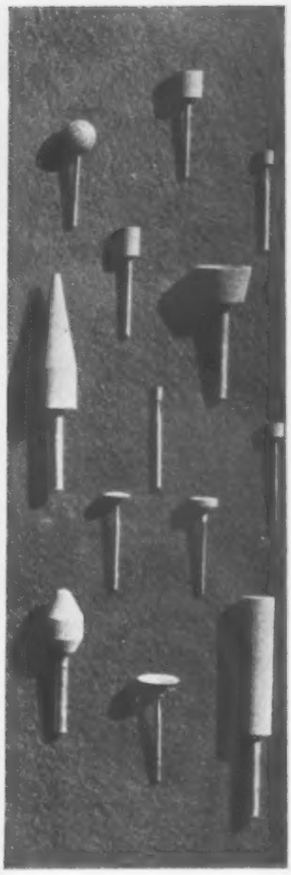
YOU'LL find these Norton Mounted Wheels and Mounted Points mighty handy for all kinds of die sinking and metal pattern making. They quickly and easily remove stock and leave a clean, smooth surface. The many available shapes make it possible to reach the hard-to-get-at places.

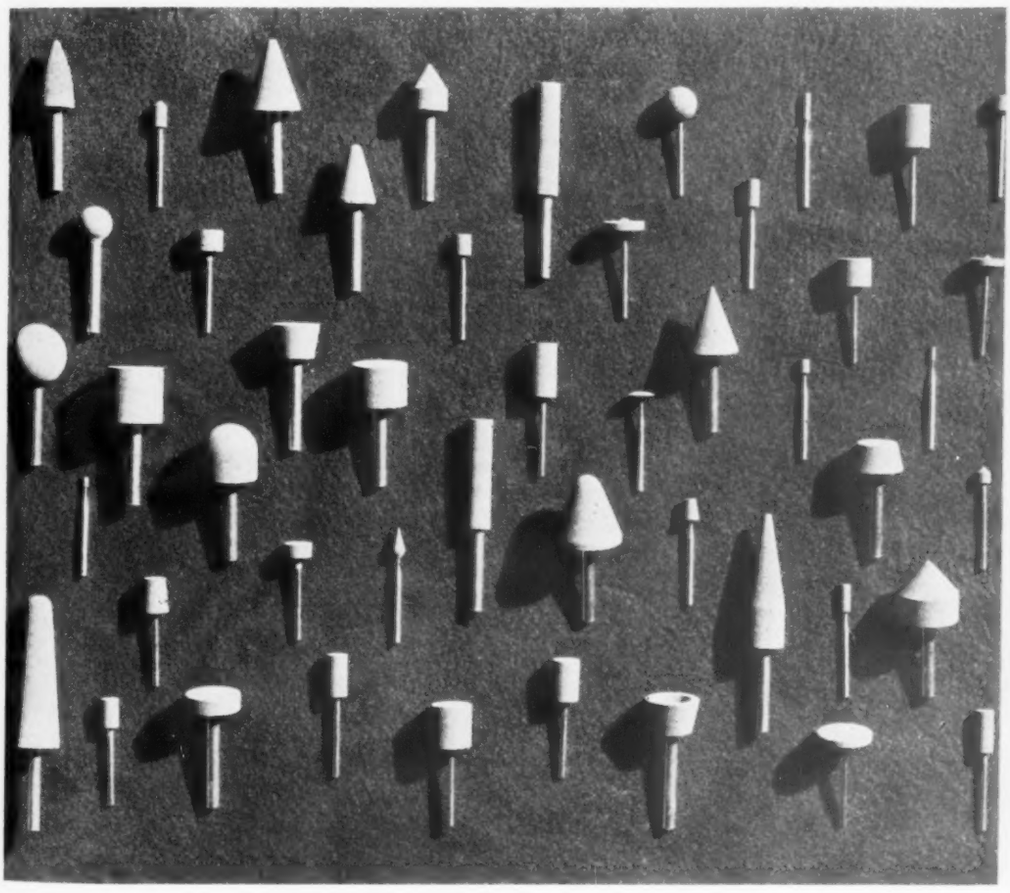
The cutting material in Norton Mounted Wheels and Mounted Points for die sinking is 38 Alundum abrasive—long famous for its grinding ability on hard, tough tool steels and steel alloys.

The spindles are made of a special steel and are first copper plated and then nickel plated. A chisel end on the spindle and a special cement assure a securely anchored mount —allowing Norton Wheels and Points to be used down to a very small stub—an important economy feature.

NORTON COMPANY, WORCESTER, MASS.

New York Chicago Detroit Philadelphia Pittsburgh Hartford
Cleveland Hamilton, Ont. London Paris Wesseling, Germany





Send for this catalog of Norton Mounted Wheels and Mounted Points—no charge or obligation.

W-448

NORTON GRINDING WHEELS

Rapid recorder (left) and radiation tube (right) developed by Pyrometer Instrument Co.

veloped a super-sensitive radiation tube and a rapid recorder, both of which are shown in the accompanying illustrations. The tube is a compact, self-contained unit which records temperature changes practically instantaneously, having a time lag of approximately 2 seconds.

High furnace temperature, as in hardening, billet forging, preheating, melting and electric hydrogen furnaces, can be recorded and controlled with sustained accuracy with the radiation tube. It also is possible in many instances, to record and control the temperature of the material itself. The radiation tube and rapid recorder measure the temperature of billets, rods, sheets etc., in the process of hot rolling, aside from furnace temperatures. The recorder, due to rapid travel of chart, gives a legible production record for any given period.

◆

Small Coupling Flanges Are Aluminum Alloy

Smith Power Transmission Co., 434 Penton building, Cleveland, has introduced a new series of small industrial couplings. Flanges of this series are of special aluminum alloy which has a high strength-weight ratio. Connection of the flanges is made by socket head cap screws through specially designed flexible fabric disks in such manner that there are no metal-to-metal bearing surfaces. The small series couplings, which may be used in either a horizontal or vertical position are available in two sizes: diameter of 2⅝ inches, capable of transmitting 1 horsepower at 1800 revolutions per minute; and diameter of 3⅛ inches capable of transmitting 3 horsepower at 1800 revolutions per minute.

◆

Hydraulic Grinder Is Neat And Compact Unit

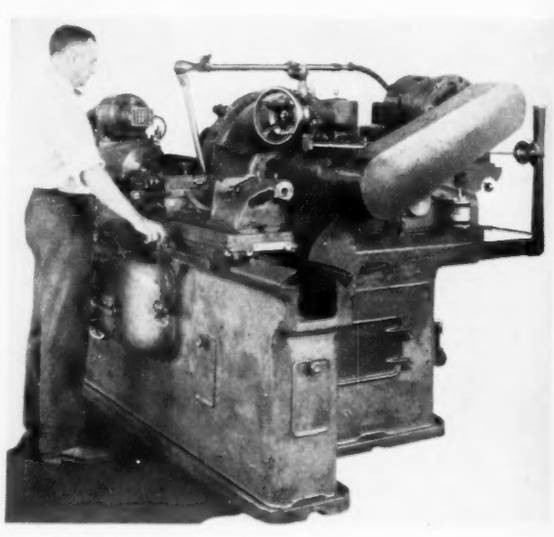
Landis Tool Co., Waynesboro, Pa., recently developed a new 10-inch type C. plain hydraulic grinding machine, shown herewith, which supplements its 6-inch machine of the same type. Such work as motor armatures, shafting and camshaft line bearings are typical jobs to be assigned the unit. Accessibility to the various mechanisms in case of inspection, adjustment or repair is another very desirable feature. By removing the cover at the front of the bed all control mechanisms are exposed, according to the manufacturer.

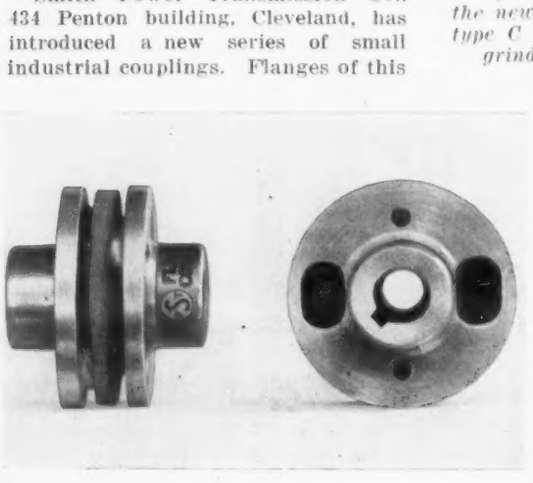
Special attention is directed to the hydraulic table traversing mechanism which is of the twin cylinder type. Due to the design the volume of oil in the cylinders is constant regardless of the direction of traverse. The result is unusual smoothness of operation. Table speeds ranging from 6 to 240 inches per minute may be secured. The bed is well webbed and of pure box type construction. The work carriage traverses on a flat and a V guide well spaced and with chilled surfaces. Guide way lubrication is of the flood type, filtered oil being used and being supplied by the same oil pump which furnishes, pressure for the hydraulic system. The grinding wheel head is supported similarly to the carriage traverse.

Six Work Speeds Available

Oil pump and water pump are mounted in line with each other as a single unit and are driven by a constant speed motor. The grinding wheel feed is of the conventional Landis type with a final movement through a long screw and bronze half nut. Automatic hydraulic wheel feed, which functions at each reversal of the table, may be supplied upon special order at extra cost. The headstock is driven by a constant speed motor, thereby reducing electrical equipment costs. Six work speeds are available by changing pulleys and belts at the left-hand end of the head.

Right — Controls are skillfully grouped on the new Landis 10-inch type C plain hydraulic grinding machine





Left—One of a series of small couplings introduced by Smith Power Transmission Co.

Confidence Building Up, but Steel Rate Dips

Loss of 1 Point Reflects Slower Shipments, While Second Quarter Covering Proceeds—Pig Iron and Scrap Stronger—Exports Gain

PROGRESS in the iron and steel industry today is like that in the initial stage in the erection of a skyscraper; the various steps taken at Washington are generally believed to be laying the foundation for a strong industrial structure, but the work in terms of actual steel demand is not yet visible.

Though business is getting established on a firm basis, and a note of confidence persists, so far this has not resulted in any pronounced increase in consumption; in fact, steel ingot output last week eased off a point to 14 per cent.

An improvement in operations at Cleveland and Buffalo has been more than offset by reductions at Pittsburgh, Youngstown and eastern Pennsylvania, while at Chicago and Birmingham the rates are unchanged. In the Ohio river district floods have impeded operations.

Sentiment with regard to the immediate outlook for steel has become a little more subdued since it has appeared that inflation is not in early prospect. Though consumers have protected themselves on a larger tonnage and farther ahead than at any previous time in more than a year, it is too early to gage their actual requirements. Currently, shipments are slightly lower than before the bank holidays.

Activity is notable in pig iron. Purchases by Chicago district foundries are the heaviest in more than two years. Cleveland furnaces have booked 7000 tons additional. In eastern Pennsylvania, orders have been placed for delivery into the third quarter at advances of 50 cents to $1 a ton. Producers at St. Louis are urging consumers to protect themselves.

Though demand for iron and steel scrap at Chicago has moderated slightly, important sales at Pittsburgh and other centers have carried up the general level of prices. Germany has purchased 6000 tons of armor scrap, long in storage at Philadelphia. Japan also continues to take large shipments from this country.

Steelmakers are more hopeful of holding present official prices on heavy finished steel than they are for obtaining advance in the near future. Strength is manifest in the withdrawal of lower figures, time limits placed on new contracts, and also limitations on tonnage consumers will be permitted to specify.

Plates, shapes, bars and semifinished have been reaffirmed for second quarter at present levels. An advance of $2 a ton in galvanized sheets has been announced for April 5. More liberal discounts on cap and set screws result in a 10 per cent price reduction.

Some large steel requirements are emerging with preparations for beer manufacture. Inquiries have developed from Milwaukee for 2000 tanks; an Ohio fabricator has taken prices on 50,000 tons of plates and other material. A Milwaukee brewery has placed 1000 tons of structural shapes for an annex.

Led by an award of 3500 tons for a Pennsylvania railroad bridge, shape tonnage has improved moderately. Seattle is taking bids on 9000 tons of structurals for a sea wall and powerhouse. Municipal pipe projects are showing seasonal expansion, San Francisco purchasing 1400 tons; Everett, Wash., 1800 tons; 3500 tons are active at New York. A Denver water tunnel contract will require 2600 tons of plates.

Railroads remain out of the market except for miscellaneous requirements, the Pennsylvania taking bids on 10,000 tons for second quarter. Argentine state railroads will exchange corn in Spain for 17,000 tons of rails.

For the second consecutive month, iron and steel exports have increased, and imports fallen. February exports, 63,936 tons, were up 7216 tons over January; and imports, 19,748 tons, were down 2144 tons.

STEEL's price composites remain unchanged this week, except for an 8-cent advance in scrap.

Composite Market Averages

	March 25	March 18	One Month Ago Feb., 1933	Three Months Ago Dec., 1932	One Year Ago March, 1932	Ten Years Ago March, 1923
Iron and Steel Composite	$28.35	$28.35	$28.31	$28.93	$29.61	$45.31
Finished Steel Composite	45.60	45.60	45.35	46.74	47.09	64.40
Steelworks Scrap Composite	6.54	6.46	6.33	6.41	7.94	23.80

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate pipe. Steelworks Scrap Composite:—Melting steel, compressed sheets.

COMPARATIVE PRICES OF IRON, STEEL AND COKE

Representative Market Figures for Current Week, Last Month, Three Months and One Year Ago

	March 25, 1933	Feb. 1933	Dec. 1932	Mar. 1932
Pig Iron				
Bessemer, del., Pittsburgh	$15.76	15.76	15.76	16.76
Basic, valley	14.00	14.00	14.00	15.00
Basic, eastern, del. eastern Pa.	13.50	13.50	13.50	16.00
No. 2 foundry, del. Pittsburgh	15.76	15.76	15.76	16.51
No. 2 foundry, Chicago	15.50	15.50	15.50	16.50
*Southern No. 2, Birmingham	11.00	11.00	11.00	11.00
**No. 2X, Virginia furnace	17.75	17.75	17.75	18.00
**No. 2 X, Eastern, del., Phila.	13.76	13.76	13.95	15.76
Malleable, valley	14.50	14.50	14.50	15.50
Malleable, Chicago	15.50	15.50	15.50	16.50
Lake Superior charcoal, del. Chi.	23.04	23.04	23.04	23.04
Gray forge, del. Pittsburgh	15.63	15.63	15.63	16.13
Ferromanganese, del. Pittsburgh	73.24	73.24	73.24	80.24

*1.75-2.25 silicon. For local delivery. Northern shipments based on $10, Birmingham. **2.25-2.75 silicon.

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c per gross ton, beginning Jan. 4, 1932.

Coke				
Connellsville, furnace, ovens	1.75	1.75	1.75	2.25
Connellsville, foundry, ovens	2.25	2.50	2.50	3.25
Semifinished Material				
Sheet bars, open-hearth, Youngs.	26.00	26.00	26.00	26.00
Sheet bars, open-hearth, Pitts.	26.00	26.00	26.00	26.00
Billets, open-hearth, Pittsburgh	26.00	26.00	26.00	27.00
Wire rods, Pittsburgh	35.00	35.00	37.00	37.00

	March 25, 1933	Feb. 1933	Dec. 1932	Mar. 1932
Finished Material				
Steel bars, Pittsburgh	1.60	1.60	1.60	1.55
Steel bars, Chicago	1.70	1.70	1.70	1.70
Steel bars, Philadelphia	1.91	1.91	1.91	1.81
Iron bars, Chicago	1.65	1.65	1.65	1.70
Shapes, Pittsburgh	1.60	1.60	1.55	1.55
Shapes, Philadelphia	1.65	1.70	1.75	1.62
Shapes, Chicago	1.70	1.70	1.70	1.70
Tank plates, Pittsburgh	1.60	1.60	1.60	1.55
Tank plates, Philadelphia	1.59½	1.66	1.77	1.69¼
Tank plates, Chicago	1.70	1.70	1.70	1.70
Sheets, No. 10 blue anneal., Pitts.	1.55	1.60	1.70	1.70
Sheets, No. 24, hot ann., Pitts.	2.00	2.00	2.10	2.20
Sheets, No. 24 galvan., Pitts.	2.60	2.50	2.85	2.80
Sheets, No. 10 blue anneal., Chi.	1.70	1.85	1.85	1.85
Sheets, No. 24 hot ann., Chicago	2.15	2.15	2.25	2.35
Sheets, No. 24 galvan., Chicago	2.75	2.75	2.90	3.00
Plain wire, Pittsburgh	2.10	2.10	2.20	2.20
Wire nails, Pittsburgh	1.85	1.85	1.95	1.95
Tin plate, per base box, Pitts.	4.25	4.25	4.25	4.75
Scrap				
Heavy melting steel, Pitts.	$9.00	8.35	8.70	10.25
Heavy melting steel, eastern Pa.	6.50	6.50	7.25	7.35
Heavy melting steel, Chicago	5.25	5.25	5.45	6.75
No. 1 wrought, eastern Pa.	7.00	6.50	7.25	9.00
No. 1 wrought, Chicago	5.00	5.00	5.05	6.25
Rails for rolling, Chicago	8.25	7.75	8.25	9.50

Sheets

Galvanized To Be Advanced—Specifications Limited to March 31 on Contracts

SHEET PRICES, PAGE 45

Pittsburgh—Galvanized sheets will be advanced $2 per ton, to 2.70c Pittsburgh, on April 5. Consumers will be given opportunity to place their second quarter requirements at the current level of 2.60c up to that date. It is intimated that a further advance on galvanized is considered, and that other sheet classifications may be strengthened. Mainly through desired protection and not from anticipation of better releases, many sheet buyers have been asking third quarter coverage in small lots, which has been refused. Demand for immediate shipment continues highly irregular. After being closed since May, 1932, the small Wood works at McKeesport, Pa., of the American Sheet & Tin Plate Co. was reopened March 21. Hot-rolled annealed No. 24 are quoted 2.00c, Pittsburgh, and cold-rolled No. 20 2.30c.

Boston—Sheet prices are steadier, although there is little forward buying. Small spot orders have improved, including several cars of blue annealed to a small tank fabricator. Galvanized on general run of business is steady at 2.60c, Pittsburgh.

New York—Sheet consumers are specifying more actively as limit is approached on protections at prices under the current market. Some sellers have fixed March 31 as the deadline, with deliveries to be made at mills' convenience up to and including April 15. Strength is being manifested in the increasing number of second quarter contracts being consummated at the new schedules.

Philadelphia—Sheet consumers are contracting for second quarter at the new schedules. Meanwhile, actual releases are coming out more freely against protections at lower prices. Some mills are accepting these releases up to March 31, for delivery at the mills' convenience by April 15.

Cleveland—Following the release of automotive sheets which were held back temporarily due to the banking situation, new specifications have not developed as much tonnage as anticipated. The local sheet mill was idle during the greater part of the past week, though shipments continued to be made from stock. A mill west of here, rolling automotive sheets, operated at 15 per cent. Recent Ford orders are understood to have been limited to about 1500 tons. Despite the slow movement in the automotive market, larger tonnage is promised shortly. Other demands for sheets continue light. A few contracts for second quarter have been signed on the basis of present prices, including black at 2.00c, and galvanized at 2.60c.

Cincinnati—General inquiry at sheet mills improved this week, but betterment in shipments was only moderate, total tonnage being affected by the Ohio river flood which handicapped one local interest.

Chicago—Sheet prices are steady, although the recent increase in inquiry has developed into only a small amount of forward buying. Shipments show a small increase. Consumers are less active in attempting to obtain price protection for more than second quarter. Automotive needs are slow to increase despite resumption at some plants.

St. Louis—Sheet buying continues quiet, but inquiry from a number of sources has increased, and the outlook for second quarter business is distinctly hopeful. Producers say it is still too soon after the financial upheaval to realize large tonnage.

Birmingham, Ala.—Production at sheet mills at about the average since the turn of year, except through the banking holiday. Inquiries are improving as the financial situation clears.

CURRENT FINISHED STEEL PRICES

Delivered prices subject to freight surcharge corrected to nearest ½c. Asterisk denotes price change this week

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

Pittsburgh, base..	1.40c
Chi. dist. mills.....	1.50c
Chicago, del.	1.55c
New York, del.....	1.75c
Birm., base	1.55c
Philadelphia, del...	1.71c

BLUE ANNEALED No. 9-10

Pittsburgh, base..	1.55c
Chi. dist. mills	1.65c
Chicago, del	1.70c
Phila., del.	1.86c to 1.96c
New York, del.....	1.90c to 2.00c
St. Louis, del.	1.89c
Birm., base	1.70c
San Fran., c.i.f.....	2.32½c

HOT ROLLED ANNEALED
No. 24

Pittsburgh, base..	2.00c
Chi. dist. mills....	2.10c
Chicago, del.	2.15c
New York, del.....	2.35c
Phila., del.	2.31c
Birmingham, base	2.15c to 2.25c
St. Louis, del.	2.34c
San Fran., c.i.f.....	2.85c
Detroit, del.	2.18½c

GALVANIZED No. 24

Pittsburgh, base..	2.60c
Chi. dist. mills.....	2.70c
Chicago, del.	2.75c
Philadelphia, del..	2.91c
New York, del.....	2.95c
Birm., base	2.75c
St. Louis, del.	2.94c
San Fran., c.i.f.....	3.50c

TIN MILL BLACK No. 28

Pittsburgh, base..	2.30c
Gary, base	2.40c
St. Louis, del.	2.64c

HEAVY COLD ROLLED
No. 10

Pittsburgh, base..	1.90c
Chi. dist. mills.....	2.00c
Chicago, del.	2.05c
Philadelphia, del..	2.21c
New York, del.....	2.25c

COLD ROLLED No. 20

Pittsburgh, base..	2.30c
Do, autob. qual.	2.55c
Do, furn. qual.	2.90c
Chi. dist. mills	2.40c
Chicago, del.	2.50c
Philadelphia, del..	2.61c
New York, del.	2.65c

Corrosion, Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel sheets, 35c; plates, 31c; bars, 28c.

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	21c	22.5c	25c	30c
Sheets	26c	27.5c	30c	35c
Hot Strip	19c	20.5c	23c	28c
Cold Strip	25c	26.5c	29c	34c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base..	1.60c
New York, del.....	1.70c to 1.80c
Phila., del.	1.59½c to 1.69½c
Boston, del.	1.82c to 2.02c
Buffalo, del.	1.85½c
Chicago, base	1.70c
Cleveland, del.	1.78½c
Birmingham, base	1.75c
Coatesville, base..	1.50c to 1.60c
Pacific Coast, c.i.f.	2.00c
St. Louis, del.	1.94c

Structural Shapes

Pittsburgh, base..	1.60c
Philadelphia, del...	1.65c to 1.75c
New York, del.	1.77c to 1.87c
Boston, del. ....1.90½c to 2.00½c	
Chicago, base	1.70c
Cleveland, del.....	1.78½c
Lackawan., base..	1.70c
Birmingham, base	1.75c
Pacific Coast, c.i.f.	2.10c
Do., wide flange	2.20c

Bars

SOFT STEEL

Pittsburgh, base..	1.60c
Chicago, base	1.70c
Birmingham, base	1.75c
Lackawan., base..	1.70c
Pacific Coast, c.i.f.	2.00c
Cleveland, base....	1.65c
Philadelphia, del..	1.91c
New York, del.....	1.95c
Boston, del.	2.02c
Pitts., cold finish..	1.70c
Pitts., forg. qual..1.75c and	1.85c
San Fran., c.i.f.....	2.10c

RAIL STEEL

Pitts., Buff., Chi...	
St. Louis	1.50c
Eastern mills	1.30c

IRON

Chicago, base	1.60c to 1.65c
New York, del.....	1.85c to 1.90c
Philadelphia, del...	1.81c to 1.86c
Pitts., refined.....	2.70c to 4.20c

REINFORCING

Billet, mill l'gths.	
Chi., Pitts., Buff.	1.40c
Do Cleveland..	1.45c
Do Detroit	1.60c
Chicago, rail steel	1.30c
*Phila., cut lengths	1.86c

Wire Products

(Prices apply on carload lots. Mixed carloads 10 cents higher with 10% discount off extras; joint carloads 10 cents higher with no discount from extras; pool carloads 20 cents up; less carloads 30 cents up.)

F.o.b. mills, 100 lb. keg

Standard wire nails.....	$1.85
Cement coated nails	1.85
Galvanized nails	3.35

(Per pound)

Polished staples	2.55c
Galvanized fence staples..	2.80c
Barbed wire, gal.	2.35c
Annealed fence wire	2.25c
Galvanized wire	2.60c
Woven wire fencing (base column, c.l.).....$50.00	

(To Manufacturing Trade)

Plain wire, 6-9 ga.	2.10c
Spring wire	3.10c

Chicago and Anderson, Ind., $1 over Pitts.-Cleve.; Duluth and Worcester, $2 higher; Fairfield, Ala., $3 higher.

Cold-Finished Bars, Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.....	1.70c
20,000 to 59,999 lbs.....	1.65c
6,000 to 99,999 lbs.....	1.60c
100,000 lbs. and over....1.57½c	

Chicago, Cleveland, Buffalo 5c higher; Detroit, 20c; eastern Michigan 25c.

Tin and Terne Plate

Per 100-lb. box, Pittsburgh

Tin plate, coke base, contract..	$4.25
Do., stock	3.75
Long ternes, No. 24 unassorted	2.75c

Gary base, 10 cents higher.

Alloy Steel

Hot rolled, f.o.b. Pittsburgh, Buffalo, Chicago and Massillon, O. Base 2.45c to 2.65c. Differentials to various classes of consumers.

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.30
2500	2.25	3400	3.20

4100 .15 to .25 Mo.	0.50
4600 .20 to .30 Mo. 1.25-1.75 Ni.	1.05
5100 .80-1.10 Cr.	0.45
5100 Cr. spring	0.20
6100 bars	1.20
6100 spring	0.95
Cr., Ni., Van.	1.50
Carbon van.	0.95
9250 (flats)	0.25
9250 (rds., sq.)	0.50

Strip, Hoops, Bands

Hot-rolled strip up to 23 15/16-in. wide, Pitts..	1.45c
Do., Chicago	1.55c
Do., del. Phila...	1.76c
Do., del. N. Y.	1.80c
Cooperage hoop, Pittsburgh	1.55c to 1.60c
Do., Chicago	1.65c to 1.70c
*Cold roll, strip, Pitts., Cleve.	1.80c to 2.00c
Worcester, 3 tons or over	2.10c

Rails, Track Material

Stand. rails, mill	$40.00
Relaying rails, Pitts., 20-45 lbs.	$20.00 to 22.00
50 to 75	$16.00 to 18.00
80 to 100	$20.00 to 21.00
Light rails, 25-45, mills	$30.00
Light rails, Chi....	$32.00
Angle bars, mills..	2.55c
Spikes, R. R. mills	2.15c
Spikes, boat, b'ge, Pitts.	2.65c
Track bolts, Chi...	3.50c
Do., stand., job.	73 off list
Tie plates, Pitts.	$35.00
Tie plates, Chi.....	$35.00

Rivets, Wrought Washers

Struc., c.l., Pitts.-Cleve.	2.25c
Struc., c.l., Chi.....	2.35c
7/16-in. & smaller, Pitts., Chi., Cleve. .....70, 10 and 10 off	
Washers, c.l., Pitts. dist.	6.50 to 6.75 off
Do., Chi. dist....	7.00 to 6.75 off

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chi. Discounts to legitimate jobbing or large consuming trade for full-case lots apply to Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread.....	75 off
Rolled thread ½ x 6 and smaller	75 off
Eagle list	75 off

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts	75 off
Tire bolts	60 and 10 off

Stove bolts, 75, 25 and 10 off in pkgs.; 86 off in bulk, 5000 or more of a size.

Rolled thread machine bolts, ½ x 6 and smaller 75 off.

NUTS

Semifinished	75 off

HEXAGON CAP SCREWS

*Milled	85-10 off
*Upset 1-in. diam., smaller	85-10 off

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller	75-10-10 off
*Headless set screws.....	80 off
*Upset, larger than 1-in....	80 off

Cut Nails, Piling

Cut nails, c.l., Pitts.....	$2.50
Do., less carloads, 5 kegs or over	$2.90
Less than 5 kegs	$3.05
Steel sheet piling, Pitts...	1.90c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pittsburgh and Lorain, O., to consumers in carloads, Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago delivered, 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD
Steel

In.	Blk.	Gal.
¼ and ⅜	57	34
½	62	49½
¾	65½	55
1—3	67½	57

Iron

½	28	10½
¾	33	16½
1—1¼	36	20½
2	38	21

LAP WELD
Steel

2	61	50½
2½ to 6	64½	54
8	62	51
10	60	49
12	59	48

Iron

2	26	12½
2½—3½	33	18½
4—6	35	22
7—8	34	21½
9—12	31	16½

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RAW MATERIAL PRICES

Delivered pig iron prices subject to 10 per cent freight surcharge, maximum 13.44c gross ton, from Jan. 4, 1932. Asterisk denotes price change this week

STEEL LINE PIPE

Steel

2 to 3 butt	66⅔
2 lap	60
10 lap	59

Iron

2½ to 6 lap	63½
8 lap	61
12 lap	58

Discounts on steel and iron pipe are net.

BOILER TUBES

Carload discounts, f.o.b. Pittsburgh

Lap Welded Steel		*Charcoal Iron*	
1—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¾—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Quantity discounts same as for hot rolled, below. Charcoal Iron—Under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1 inch	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Quantity discounts are: Under 10,000 pounds, 10 points and 5 per cent; 10,000 to 24,999 pounds, 6 points and 5 per cent; 25,000 pounds to carload, 2 points and 5 and 5 per cent; carload and over, base discount and 5 and 5 per cent. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill discounts

*100 ft. or 150 lbs.	40%
*15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$32.00-33.00
4-in. Birm.	35.00-36.00
4-in. Chicago	43.40-44.40
6 to 24-in. Chicago	40.40-41.40
6-in. & over, N. Y.	32.00-34.50
4-in. New York	34.50-36.50

Class A pipe $3 higher than Class B.

Stand. fitgs., Birm. base...$90.00

Six to 24-inch, fittings, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Pig Iron

Per Gross Ton

FOUNDRY, No. 2

Chicago, furnace	$15.50
Pitts., dist. fur.	15.00
Pittsburgh, del.	15.63-16.13
Valley furnace	14.50-15.00
Cleve. fur., local del.	15.00
Philadelphia, del.	13.26-13.76
Virginia furnace	17.25
Granite City, Ill.	16.50-17.00
Buff., fur., local del.	16.00
Buff., all-rail, Bost.	18.91-19.91
Do, Brooklyn	18.90
Do, Newark	17.28
Ala., Bir. fur., local	11.00
Ala., Nor. del., Bir.	10.00
Ala., del. Chicago	16.01
Ala., del. St. Louis	14.42
Ala., del. Cincinnati	13.82
Ala., Phila., dock del.	15.00-15.25
Ala., Balt., dock del.	15.00
Ala., N. Y. dock	15.50
Ala., Bost. dock del.	15.75-16.75
Tenn., Bir. base	13.00
Tenn., del. Cinci	13.82
Montreal, del.	23.00-23.50
Toronto, del.	22.10

FOUNDRY, No. 2X

Buff., fur., local del.	16.50
Buff., all-rail, Brook.	19.40
Do, Newark	17.78
Buff., all-rail, Bost.	19.91-20.91
Virginia furnace	17.75
Eastern, del. Phila.	13.76-14.26

FOUNDRY, No. 1X

Buff. fur., loc. del.	17.50
Eastern, del. Phila.	14.26-14.76

MALLEABLE

Valley furnace	14.50-15.00
Cleve. fur., loc. del.	15.00
Pittsburgh dis. fur.	15.00
Pittsburgh, del.	15.63-16.13
Chicago, furnace	15.50
Buff., fur., loc. del.	16.50
Eastern Pa., del.	14.63-18.91
Granite City, fur.	16.50-17.50
Montreal, del.	24.00
Toronto, delivered	22.60

BASIC

Pitts., dist. fur.	14.00
Pittsburgh, del.	14.63-15.13
Eastern, Pa., del.	13.50
Buff. fur., loc. del.	15.50-16.00
Montreal, del.	23.50
Valley, furnace	14.00

BESSEMER

Valley furnace	14.50-15.00
Pittsburgh fur	15.00
Pittsburgh, del.	15.63-16.13

LOW PHOS.

Valley, fur., stand.	25.00
Phila., standard	22.76-25.79
Copper bear., E. Pa. furnace	20.50-21.50

GRAY FORGE

Valley furnace	14.00
Pitts. dist. fur.	15.00
Pittsburgh, del.	15.63-16.13

CHARCOAL

Lake Sup., del. Chi.	23.04

SILVERY

Jackson County, O., fur. 6%—$18.00; 7—$18.50; 8—$18.75; 9—$19; 10—$19.50; 11—$20; 12—$20.50; 13—$21.50; 14—$22.50; 15—$23; 16—$24; 17—$25.50.

Pittsburgh and Buffalo furnace: 7 to 10—$19; 15—$21 to $23.

BESSEMER FERROSILICON

Jackson County, O., fur., 10%—$20.50; 11—$21; 12—$21.50; 13—$22.50; 14—$23.50; 15—$24; 16—$25; 17—$26.50.

Iron Ore

LAKE SUPERIOR ORE

Gross ton, 51½%, Lower Lake Ports

Old range bess.	$4.80
Mesabi bessemer	4.65
Old range nonbess.	4.65
Mesabi nonbess.	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents, unit, del. E. Pa.

Foundry and basic, 56-63%, con. (nom.)	7.50
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per unit, f.a.s. Atlantic ports (nom.)

Foreign manganiferous ore, 45-55% iron, 6-10% man.	8.00
No. Afr. low phos.	7.00
Swedish basic, 65%	7.50- 8.00
Swedish low phos.	8.00
Spanish, No. Afr. basic, 50 to 60%	7.00
Tungsten, spot, sh. ton unit, duty pd.	$9.65- 9.90
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton c.i.f.	$15.50-16.50

Manganese Ore

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	nominal
So. African, 52%	18 to 19 cts.
So. Afr., 49-51%	nominal
Indian, 48-50%	nominal

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pa., Ohio, Ill., Ky., Md., Ga., Ala.	$35.00
Missouri	32.00

Second Quality

Pa., Ohio, Ill., Ky., Md.	25.00-30.00
Missouri	26.00
Georgia, Alabama	30.00

SILICA BRICK

Pennsylvania	$35.00
Joliet, E. Chicago	47.00
Birmingham, Ala.	50.00

MAGNESITE BRICK

Per Net Ton

Burned, 9 x 4½ x 2½	$61.50
Unburned, 9 x 4½ x 2½	52.00

CHROME BRICK

Per Net Ton

F.o.b. ship. point	$42.50

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	38.00
Domes, Chewelah, Wash., base	20.90

Fluorspar

85 to 5 per cent grade

Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$10.50
Washed gravel, import duty paid tide, gross ton	16.50

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pitts., Chi., Cleve., open-hth. & bess.	$26.00
Philadelphia	31.75
Forging, Pitts., Chi.	31.00

SHEET BARS

Pitts., Cleve., Yong.	26.00
Chicago	26.00

SLABS

Pitts., Cleve., Yong.	26.00

WIRE RODS

Pitts., Cleveland	$35.00
Chicago	36.00

SKELP

All grades, Pitts.	1.50c-1.60c

Coke

Prices Per Net Ton

BEEHIVE OVENS

Connellsville fur.	$1.75
Connellsville fdry.	2.25- 2.50
Connell. prem. fdry.	4.00
New River fdry.	6.00
Wise county fdry.	4.25- 5.00
Wise county fur.	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.21- 8.81
Chi. ov., outside del.	7.00
Chicago, del.	7.75
New England, del.	10.00
St. Louis, del.	7.75
Birmingham, ovens	4.00
Indianapolis, del.	7.75
Ashland, Ky., ovens, Connell., basis	4.50
Portsmouth, ovens Connell. basis	4.50
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.00
Philadelphia, del.	8.50

Ferroalloys

(In dollars, except Ferrochrome)

Ferromanganese, 78-82% tidewater, duty pd. (con.)	‡$68.00
del. Pitts. (con.)	‡73.24
Spiegeleisen, 19-20%, dom. fur., spot†	24.00
Ferrosilicon, 50%, freight all., c. l.	74.50
Do, less carload	82.50
Do, 75 per cent	120-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	85.00
2% carbon	90.00
1% carbon	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	9.50
Do, spot del.	10.00
Ferrotungsten, stand., lb. cont.	0.94- 1.00
Ferrovanadium, 35 to 40%, lb. cont., on analysis	2.60- 2.80
Ferrotitanium, c.l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., all., lb.	8.50
Do, under 1 ton	9.00
Ferrophosphorus, per ton, c. l. 17-19%, Rockdale, Tenn., basis; 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic per ton c. l., 23-26% f.o.b. Anniston, Ala.; 24%, $2.75 unitage	65.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Diff. to apply to quantity. ‡Spot, $7 less.

Bars

Better Buying by Automotive Consumers—Desire for Distant Protection Less Evident

BAR PRICES, PAGE 45

Chicago—Steel bar specifications are increasing slowly, aided by resumption in automotive operations and by releases against some material recently suspended. Demand from miscellaneous users is fairly steady, while shipments to farm implement manufacturers continue slow. Prices are steady and although consumers' interest in obtaining price protection is less marked, there is less hesitation in closing at current quotations. The market continues 1.70c, Chicago, for soft steel bars and 1.50c for rail steel.

Boston—While bolt and nut makers are buying more actively, tonnage moving to New England is light. The price is steady at 1.60c, Pittsburgh.

Philadelphia — Commercial steel bar inquiry is the best so far this month, with consumers showing a keener interest in next quarter requirements, whereas three months ago there was a general indifference with regard to future commitments. Prices are steady at 1.60c, Pittsburgh, or 1.91c, Philadelphia. Common iron bars are moving slowly at 1.50c to 1.55c, Pittsburgh, or 1.81c to 1.86c, delivered locally.

Pittsburgh—Inquiries and orders for hot-rolled merchant and alloy bars have improved slightly with a measure of activity again evident in the automotive trade through the release of several orders which had been held up. There appears to be some interest for third and even fourth quarter but prices are not being quoted beyond second quarter. For that time unchanged base of 1.60c, Pittsburgh, is firm. Alloy bars are 2.45c to 2.65c, base, mill.

Cleveland—Interest in the market for commercial steel bars is broader, and bookings also have improved moderately, but not all the inquiry that developed with the recent flurry in commodity prices has been converted into orders. The present price of 1.65c, base, Cleveland, has been extended for second quarter and some fairly substantial contracts have been placed.

Tin Mill Rate Holds at 40; Follansbee, Republic Gain

Tin Plate Prices, Page 45

Pittsburgh—A large order for tin plate for a seal manufacturer is being rolled. Tin mill operations have not expanded, however, over a week ago and remain at 40 per cent. Leading can makers will not finance small canners. The 40 per cent rate, however, is strictly comparable with a 45-40 per cent rate which records show prevailed through March, 1932, the only notable difference being in the price, which at $4.25 now is 50 cents less than a year ago. Tin mill black sheets and long ternes are quiet and unchanged. Follansbee Bros. Co., Pittsburgh, increased operations at its Follansbee, W. Va., tin mill slightly last week and Republic Steel Corp.'s rate at Warren, O., is better.

Cold-Finished Buying for Second Quarter Slow

Cold Finished Prices, Page 45

Pittsburgh—Few second-quarter contracts for cold finished steel bars have been returned by consumers. Orders of the past week have been largely affected by the Detroit situation and the entire market is similar to last July. Consequently, there is no test to prices that are based on 1.70c base, Pittsburgh.

Plates

Oil Tank Inquiry Expected—Brewery Opening Promises Some Tonnage

PLATE PRICES, PAGE 45

Pittsburgh — Purchase of about 2000 tons of plates for a navy dry dock which Dravo Contracting Co. will build will be delayed for two to three weeks pending a change in the basic design. No new contracts for river barges are reported the past week with the exception of formal federal contract with the Midland Barge Co. for two Mobile, Ala., barges, which take 175 tons of plates. American Bridge Co. began laying bottoms about a week ago for five of the six 196-foot deck barges for Barrett Lines Inc., Cincinnati, at its Ambridge, Pa., shops and the fabrication of some 2000 tons of plates for this work is getting under way. Inquiry for oil tanks has been increasing slightly and the Sun Oil Co. and Pan American Petroleum Co. both have important tank work to place. Plates are being quoted generally 1.60c, Pittsburgh, with coverage into second quarter.

Boston—Plate demand shows some improvement with contracts for second quarter at 1.50c to 1.60c, Coatesville, Pa. Railroad buying is light.

New York—Buying of steel plates is little improved, though inquiry is better. Brewery demand is less than had been expected. A survey indicates funds are not available for extensive brewery improvements.

Philadelphia—Plate makers report little change in tonnage, although inquiry appears more promising. Sun Oil Co. is expected to place some tanks for installation at Cleveland and Detroit and some miscellaneous brewery tanks are being figured. Prices are unchanged at 1.48½c to 1.62½c, Philadelphia.

Cleveland—Inquiries for plates for brewery tanks feature the market here. These inquiries now are of a more definite character than those noted several weeks ago and in numerous instances are for tanks actually ordered. A Milwauke brewer is inquiring for 1500 small tanks; several others range from 200 to 500. Tank manufacturers specializing on this work estimate 50,000 tons as potential demand for plates. Several boiler manufacturers have closed on moderate size plate requirements for April and May. Plate prices have been reaffirmed at 1.60c, base, Pittsburgh, for second quarter.

Chicago—Awards and inquiries in fabricated plate work are slow and generally unimproved. Production of tanks for breweries, involving small lots, is slightly more active although some of this construction still is prospective. Little business is coming from oil companies, either new construction or repairs.

Contracts Placed

2600 tons, ¼-inch plate pipe for city of Denver; fabrication contract to Stearns-Roger Mfg. Co., Denver.

1000 tons, three 500-horsepower boilers, specification 7171, San Diego naval station, Calif., to R. G. Meyler Corp., Los Angeles.

425 tons, 24 and 30-inch welded steel pipe, specification 3018, Los Angeles, to Western Pipe & Steel Co., Los Angeles.

175 tons, two barges for Mobile, Ala.,

to Midland Barge Co., Midland, Pa.
150 tons, standpipe, Port Washington, N. Y., to Chicago Bridge & Iron Works, Chicago.
100 tons, brewery equipment, Boston, to Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.

Contracts Pending

250 tons, water tank and tower for Seattle; Puget Sound Machinery Depot, Seattle, low.
Unstated tonnage, tanks for the Sun Oil Co., Philadelphia, for installation at Cleveland and Detroit, contemplated.

An Outsider Looks at The Steel Business

(*Concluded from Page* 13)

of $520,000,000. Hundreds of thousands of investors, whose savings are frozen in the securities of steel companies, are receiving no returns. Thousands of men are working part time at low wages or not at all. Salesmen have been dropped from payrolls. Sales promotional effort has been eliminated, with only one company today doing a real job along this line. Advertising appropriations have been cut to the point where they are almost non-existent. And right here is where production-minded executives are making a very serious error—putting on the brakes when the business getting is all up-hill.

What the steel business needs is a new deal and a broader perspective on the part of the men responsible for its well being. More confidence within the industry itself would have a tonic effect. More directional effort along creative lines is needed to combat the inroads of other materials now competing with steel and others that will come into the field as the result of scientific research.

If you have devoted your life to steel and if you have read this far, you are probably saying to yourself, "Who is this who is putting us on the pan? What does he know about this business and what license does he have to shoot the works?"

He's just an outsider, looking in. He isn't an operating man, as you might have concluded. Just a rank outsider wondering if the governors of the few important steel producing states couldn't help matters along a little if they took the same stand on steel made within their commonwealths that Oklahoma Bill Murray took when he put the lid on oil until the price went from 5c to $1 a barrel. And wondering, too, if the steel companies can't trust one another to the point where they can sell at a profit, whether another Will Hays or a Kenesaw Mountain Landis wouldn't be about the most constructive investment the industry could make.

These may be just fool suggestions, but remember, they are from one who knows nothing about the business. The fact remains, however, that steel has a big job ahead. And what a fine accomplishment could result if the active guiding brains of the industry would bury all hatchets and go for a week's cruise far away from office detail and ticker tape. All laws notwithstanding, only the closest kind of co-operation, or another world war which nobody wants, will bring the much needed changes that will spell progress for steel—the industry that is looked upon as the index to national prosperity.

Who will take the initiative?

Railroads

Steel for Repair Work Is Only Tonnage Moving—Erie Inquiry Promising

TRACK MATERIAL PRICES, PAGE 45

Railroads continue to defer buying except for imperative repairs, expectations of governmental action for their relief apparently having some influence for delay. A plan is said to be under consideration for exchange of excess stocks among carriers. The President's committee of eastern roads is understood to be perfecting plans first proposed by the American Railway association over a year ago. No rails are being bought in tonnage and mills are idle. The tonnage required by the Erie railroad seems the most likely to be placed. Small lots of rails are bought occasionally for repairs. Track fastenings are being taken in small lots and some miscellaneous steel requirements are being covered. Prices of track fastenings show no change, spikes at 2.15c, mill tie plates $35 per ton and standard rails $40, mill.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has received an order for air-conditioning equipment and axle-generator sets for new lounge cars for the Missouri Pacific.

The Virginian railroad will open bids March 30 on its second quarter requirements for plates, shapes and bars, and March 31 for fencing requirements. The Pennsylvania has opened bids on a variety of steel products not to exceed a total of 10,000 tons. Atlantic Coast Line opened bids March 23 on plates, shapes and bars. This railroad also is figuring on sheets. The Reading Co. is tapering its car repair requirements.

Car Orders Placed

American Railway association, five steel box cars, to Pressed Steel Car Co., through American Railway Car institute; equipment to be experimental.

Rail Orders Placed

17,000 tons, Argentine State railways, to Altos Hornos de Vizcaya, Spain; Argentine corn accepted in payment, according to reliable reports.

Wire Shows Improvement In General Buying Rate

Wire Prices, Page 45

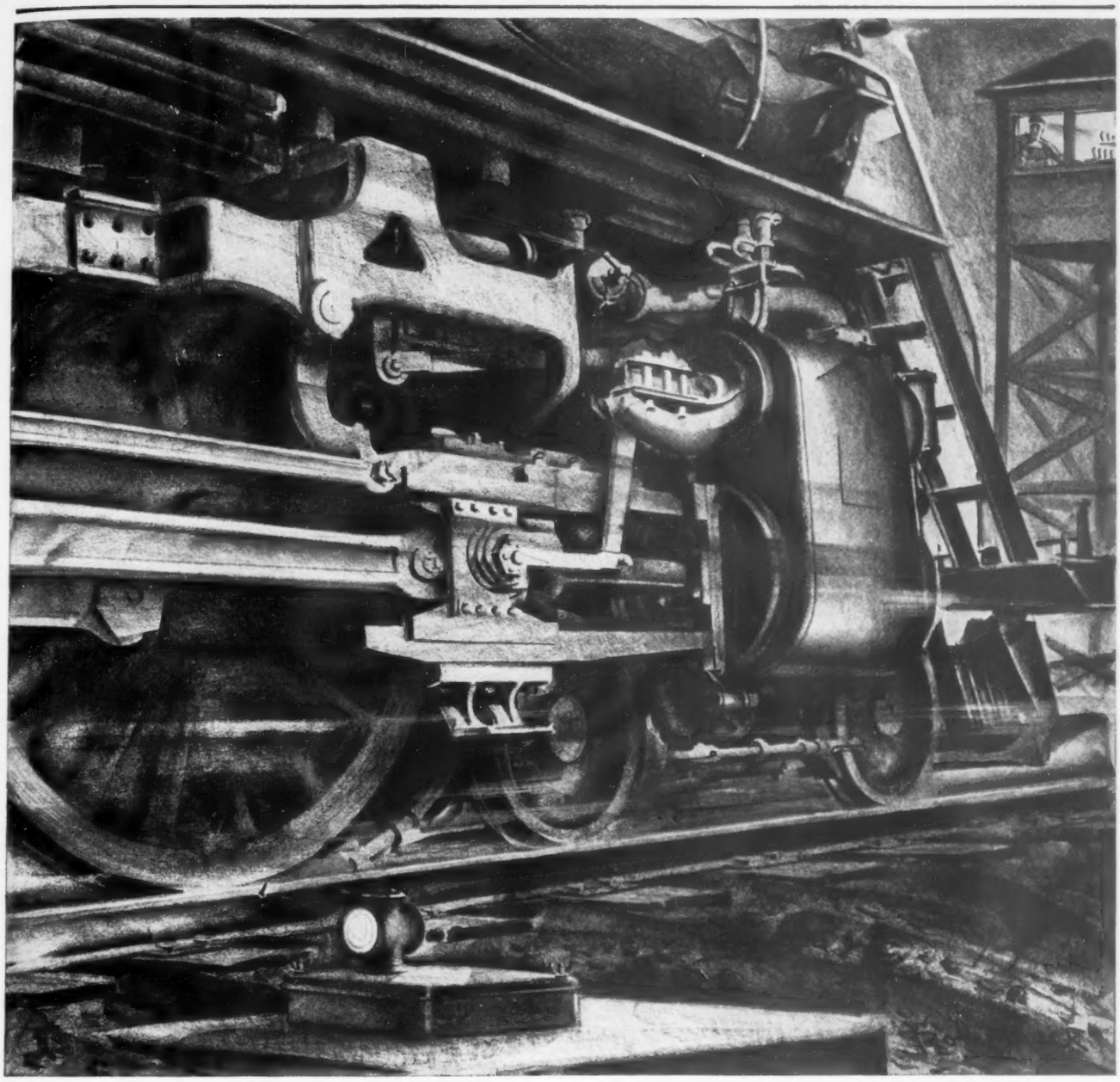
Chicago—Changes in wire specifications and shipments are slight, the general tendency, however, being toward improvement. Mill operations are fairly steady at about 20 to 25 per cent. Prices have steadied moderately as the result of interest by consumers in future requirements and some contracting is being done at $1.95 for carload lots of wire nails, and 2.15c for plain wire. Requirements of the automotive industry are slow to increase while purchases in agricultural districts still are small.

Worcester, Mass.—Wire buying shows irregular improvement, with prices steady. There is little advance covering at 2.20c on plain wire. Mill books are open for second quarter at unchanged prices.

Philadelphia—Release of specifications against protections at lower prices is noted in the wire products market. New contracting is proceeding slowly, but satisfactorily to most sellers. Current prices are firm.

Pittsburgh—Orders for plain wire, nails and other wire products underwent a severe decline last week although there is more inquiry by some consumers who have not been hear from for some time. The price is being firmly held on some products but shading continues on others. In general, 2.10c is the market for plain wire for manufacturing purposes and $1.85 a keg is quoted on nails.

Cleveland—Shipments have improved with closing of first quarter contracts, following a period of a week or more when they were nearly suspended. Mills are booking second quarter contracts cautiously, limiting tonnage in some instances.



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Structural Shapes

Volume Improves With an Award of 3500 Tons for Pennsylvania Railroad Viaduct—1000 for Milwaukee Brewery — Some Inquiries For Fourth Quarter

STRUCTURAL SHAPE PRICES, PAGE 45

New York—Structural steel awards for the week include 3500 tons for a viaduct over the Pennsylvania railroad at Newark, N. J. Other tonnage is light. The plain material price generally is 1.60c, base, Pittsburgh. The New Jersey legislature is considering state aid for shore protection, giving promise of some demand for sheet piling.

Pittsburgh — Plain material is quoted at 1.60c, base, Pittsburgh, for the second quarter, but no protections are being given beyond that time. There has been some inquiry for coverage through the third quarter and fourth quarter. Two truss spans and repairs to bridges of the Louisville & Nashville railroad will require about 800 tons. Contractors will have to purchase almost 20,000 tons for three large federal buildings recently awarded. These are the Columbus, O., and Nashville, Tenn., postoffices, and the New York courthouse.

Boston—Structural steel buying and inquiry are down sharply, with the prospect of several important New England projects being delayed. Plain material is steady at 1.60c, Pittsburgh.

Philadelphia — Outstanding in structural inquiry is approximately 1000 tons for the American Philosophical society here. Demand generally still is being seriously retarded by the credit situation. The general market on standard shapes is 1.60c, nearest mill, with special sections moving usually at a $2 premium.

Cleveland—A crane runway for a Cleveland manufacturing company, requiring 60 tons of shapes, was the largest award in this district in the week. For the Columbus, Ga., postoffice, a Canton, O., contractor will require 200 tons. The price of plain shapes has been extended for second quarter at 1.60c, base, Pittsburgh.

Chicago—Structural awards are more numerous, although only small lots are involved. Inquiry is confined to a few small items. A few additional minor lots have been placed for World's fair structures, while a Milwaukee brewery has awarded a 1000-ton addition.

Seattle—Bids are to be taken April 12 on 5700 tons of sheet piling for a sea wall project here.

Contracts Placed

3500 tons, viaduct over Pennsylvania railroad, route 21 section 1, Newark, N. J., to American Bridge Co., Pittsburgh; through George M. Brewster & Son Inc., contractors.

1210 tons, locks, dam No. 5, Winona, Minn., to Lakeside Bridge & Steel Co., Milwaukee.

1200 tons, two incinerators for New York, to Fassler Iron Works, New York, to be fabricated by Joseph T. Ryerson & Son Inc., New York.

1000 tons, Pabst Brewing Co., Milwaukee, to Lakeside Bridge & Steel Co., Milwaukee.

850 tons, federal narcotic building, Lexington, Ky., to Duffin Iron Works, Chicago.

420 tons, postoffice, New London, Conn., to Ingalls Iron Works Co., Veroma, Pa.; through Central States Construction Co., University City, Mo.

300 tons, brewery, Ridgewood, Long Island, N. Y., to Belmont Iron Works, Philadelphia; through Walter Kidde Co.

250 tons, postoffice, Bloomfield, N. J., to Passaic Steel & Iron Co., East Rutherford, N. J.

200 tons, bridge, Century of Progress exposition, Chicago, to Gage Structural Steel Co., Chicago.

160 tons, officers' apartments, Fort Jay, Governors Island, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

125 tons, bridge, Missouri Pacific railroad, to American Bridge Co., Pittsburgh.

125 tons, entrance, Century of Progress exposition, Chicago, to Johnston Iron Works, Chicago.

125 tons, postoffice, Littleton, N. H., to Shippers' Car Line Inc., Milton, Pa.; V. & M. Construction Co., New Rochelle, N. Y., general contractor.

Contracts Pending

5700 tons, sheet steel piling, Seattle seawall project; bids April 12.

Shape Awards Compared

	Tons
Week ended March 25	9,465
Week ended March 18	6,135
Week ended March 11	16,055
This week in 1932	16,975
Average weekly, 1932	14,285
Average weekly, 1933	9,485
Average weekly, Feb.	12,320
Total to date, 1932	170,221
Total to date, 1933	123,317

5000 tons, Pennsylvania railroad pier sheds at Baltimore; bids early in April.

3000 tons, state bridge, Parkersburg Landing, Pa.

1000 tons, building, American Philosophical society, Philadelphia; bids asked.

600 tons, towers, department of commerce, schedule 25130, canceled.

500 tons, bridge for the state highway department, Susquehanna, Pa.; bids March 31.

500 tons, Diablo powerhouse, Seattle municipal project; bids April 26.

400 tons, building, Southwestern reformatory, El Reno, Okla.

200 tons, bridge, Powers, Mich., for Chicago & Northwestern railroad.

200 tons, building, city hospital, Boston.

200 tons, convent, Cornwell Heights, Pa.

150 tons, building, United States marine hospital, Memphis, Tenn.; Rosen & Fishel Inc., Chicago, low.

150 tons, addition, union printers' home, Colorado Springs, Colo.

134 tons, bridge in Kit Carson county, Colorado; bids March 28.

125 tons, Pennsylvania railroad grade separation in Detroit; bids early in April.

125 tons, addition, postoffice, Schenectady, N. Y.; Spence Bros., Saginaw, Mich., low.

Bolt, Nut Covering Slow; Cap, Set Screws Down

Bolt, Nut, Rivet Prices, Page 45

Second quarter contracts for bolts and nuts are being returned by consumers in the Chicago district at unchanged prices in better volume than by those in the Pittsburgh district. Specifications to Chicago makers are holding steady but Pittsburgh producers have encountered a falling off. Requirements of automotive, agricultural implement and railroad consumers continue at a low rate. Jobbers have not bought as heavily as expected, except that Cleveland suppliers have had some good orders from northwestern jobbers. Prices remain steady at 75 off for bolts and nuts and at 2.25c, Pittsburgh, and 2.35c, Chicago for large rivets. Some makers have announced new discounts on cap and set screws, amounting to a reduction of 10 per cent in price.

Ferroalloys Quiet

Ferroalloy Prices, Page 46

Specifications for ferromanganese show little change, although an early gain is anticipated. Prices continue $61, duty paid, for spot and $68, for contracts. Domestic spiegeleisen, 19 to 21 per cent, is moving sluggishly at $24, furnace, for spot. Reports apparently emanating in Europe that Ford Motor Co. is negotiating for foreign ferromanganese, are receiving little credence.

Concrete Bars

Tonnage Shows Moderate Gain — Specifications at Pittsburgh in Larger Volume—Prices Easier at New York—Little Test Afforded in Some Districts

REINFORCING BAR PRICES, PAGE 45

New York—Weakness has again developed in concrete reinforcing billet steel bars, prices having failed to hold on keen competition for several large projects in this district. On the larger lots 1.55c is shaded sharply. New inquiry is light, but 710 tons were placed for a viaduct section at Newark, N. J.

Boston—Concrete bar awards are small, with 1.50c, Buffalo, firmer for mill lengths. Rail steel moves slowly, the district mill operating at about 25 per cent. The price is steady at 1.30c, Buffalo.

Philadelphia—Despite a lack of tonnage in this district, concrete bar prices show greater stability. The usual distributors' price on carlots in cut lengths is 1.55c, Pittsburgh, or 1.86c, Philadelphia.

Pittsburgh—Specifications for new billet steel are improving, and though mill backlogs are mainly small lots, the March volume for some interests is as large as that of any month since last fall. Carloads of new billet steel are taking a price of 1.40c, base, Pittsburgh, on mill lengths, and 1.55c for cut lengths. Rail steel bars are quiet and unchanged at 1.30c, Pittsburgh.

Cleveland—Demand for concrete bars is restricted to small, miscellaneous lots, prices being practically untested. The state is reviving road projects, taking several hundred tons, suspended during the recent banking holidays.

Chicago—Awarding of 550 tons for the St. Paul postoffice is the only outstanding order in this market. Little change is noted in the number of small projects. Prices are fairly steady.

Contracts Placed

710 tons, viaduct, route 29, section 10B, Newark, N. J., to Kalman Steel Corp., Bethlehem, Pa.; P. T. Cox Co., general contractor.

550 tons, St. Paul, postoffice, to Kalman Steel Corp., Bethlehem, Pa.

360 tons, reinforcing material for Yaquina, Oreg., jetty, to unnamed interests; Hauser Construction Co., Portland, Oreg., general contractor.

330 tons, postoffice, San Jose, Calif., to Soule Steel Co., San Francisco.

225 tons, bridge, Oscaloosa county, Florida, to Vincennes Bridge Co., Vincennes, Ind.

175 tons, storage unit, Great West Mill & Elevator Co., Amarillo, Tex., to Sheffield Steel Corp., Kansas City, Mo.; Jones-Hettlesater Construction Co., general contractor.

130 tons, bridge and addition to Naval War college, Newport, R. I., to Joseph T. Ryerson & Son Inc., Boston.

120 tons, balloon hangar, Sunnyvale, Calif., to W. S. Wetenhall Co., San Francisco.

120 tons, police and fire station, Cambridge, Mass., 70 tons to Concrete Steel Co., and 50 tons to Joseph T. Ryerson & Son Inc., Boston.

115 tons, state bridge over San Diego river, San Diego county California, to unnamed interest.

115 tons, building, state hospital, Willard, N. Y., to Concrete Steel Co., New York.

100 tons, additions to veterans' hospital, Tuscaloosa, Ala., to Conners Steel Co., Birmingham, Ala.; through Murch Bros. Construction Co. Virginia Bridge & Iron Co., awarded 55 tons of shapes.

Unstated tonnage, Phelps Vocational school, Washington, to National Building Supply Co., Baltimore; Catalano Construction, general contractor.

Unstated tonnage, postoffice, Columbus, O., to Kalman Steel Corp., Bethlehem, Pa., James Devault, Canton, O., general contractor.

Contracts Pending

1678 tons, Seattle seawall project; bids April 12.

135 tons, building work, Camp Knox, Ky.

Coke

Chicago Shipments Steady; Slow in Other Districts

COKE PRICES, PAGE 46

Only at Chicago can a moderately optimistic note be detected in the industrial coke market. There, shipments continue steady and compare favorably with February. In other districts the momentum prior to the banking holiday has not been regained. Domestic coke demand everywhere is considerably lower.

Beehive foundry is unchanged, at Pittsburgh, at $4 for premium brands and $2.25 to $2.50 for common brands. By-product coal for coking purposes is reported weaker at Pittsburgh and now is quoted 90 cents to $1; a large steel mill in Ohio last week reduced its monthly schedule from 14,000 tons to 6000 tons. Foundry coke continues $7, Chicago, ovens, for outside delivery. Cincinnati sellers may not reduce domestic prices April 1 as usual.

Concrete Awards Compared

	Tons
Week ended March 25	3,050
Week ended March 18	2,508
Week ended March 11	5,250
This week, 1932	4,120
Average weekly, 1932	3,920
Average weekly, 1933	3,604
Average weekly, Feb.	3,539
Total to date, 1932	61,447
Total to date, 1933	46,862

Sheet Sales and Output Increased in February

Sheet steel sales in February averaged 2876 net tons daily, compared with 2439 tons in January; and production averaged 3275 tons, up from 2753 tons, according to the current report by the National Association of Flat Rolled Steel Manufacturers, Pittsburgh. The increase in shipments was from 2556 tons daily to 2599 tons in February.

Sales last month totaled 80,550 tons; output, 3275 tons; shipments, 72,772 tons. Unfilled tonnage March 1 was 83,760 tons, compared with 77,509 tons Feb. 1. Total sheet capacity in the United States for the month was approximately 550,000 tons, and the capacity on which the association's report is based was 330,000 tons.

Corp. Cuts Salaries 10%

United States Steel Corp.'s reduction of 10 per cent in working hours of salaried employes April 1, with a commensurate reduction in salaries, is the third step in salary adjustment. First was a basic cut of 10 to 15 per cent in August, 1931, and second a cut of 15 per cent in May, 1932.

This action is said to be in line with more drastic steps of many other steel companies and is designed to spread employment as well as reduce expenditures. The basic wage rate in the mills is not affected nor is any change contemplated.

Maintenance Engineering Co., 1400 Conti street, Houston, Tex., has been appointed southwestern distributor for the Ashton Valve Co., Cambridge, Mass.

Pipe

Larger Tonnages Placed by Western Municipalities — 60-Mile Oil Line Project Reviving

PIPE PRICES, PAGE 45

Pittsburgh—Revival of the 60-mile pipe line from Toledo, O., to Detroit, for the Pure Oil Co., appears probable and bids may be taken over early in April. Black and galvanized pipe is moving slowly to jobbers. Shipment of oil country goods also is restricted. California stocks of casing and other oil country goods belonging to Jones & Laughlin Steel Corp. and Pittsburgh Steel Co., both of Pittsburgh, were relatively unaffected by the recent earthquake.

New York—Public Service Electric & Gas Co., Newark, N. J. is in the market for 375 tons of 4 and 6-inch cast pipe. Including small lots and the large inquiry for Montrose, N. Y., previously noted, about 3500 tons is active in this district. Prices are holding around $30, eastern foundry.

Chicago—Interest in the cast pipe market is centered on the 10,000-ton Chicago pumping station, low bidders for which have been announced. Possibilities of application of a state sales tax may hasten purchase of this tonnage. Orders and inquiries recently have been light.

Boston—Cast pipe buying is dull. The majority of recent sales were on a basis of $30 a ton, eastern foundry. Boston has not closed on 1200 tons on which bids were taken recently.

Birmingham, Ala.—Improvement is noted in many directions in demand for cast iron pipe.

Cast Pipe Placed

1800 tons, 12 and 16-inch, water system extension, Everett, Wash., to Pacific Water Works Supply Co., Seattle, for French material.

100 tons, 4 to 6-inch, Providence Gas Co., Providence, R. I., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

Cast Pipe Pending

10,260 tons, 30 to 48-inch pipe and fittings, Chicago pumping station; United States Pipe & Foundry Co., Burlington, N. J., and James B. Clow & Sons, Chicago, low.

900 tons, Seattle seawall project; bids April 12.

655 tons, 2 to 8-inch class 150 and 250, Oakland, Calif.; bids March 24.

375 tons, 4 and 6-inch, Public Service Electric & Gas Co., Newark, N. J.

315 tons, water system, Owenton, Ky.; R. F. C. to loan $65,000. Project includes 3500 feet of copper bearing service pipe, and 75,000-gallon steel tank.

310 tons, 16-inch, Washington; bids March 30.

300 tons, 6 to 12-inch, Newton, Mass.; R. D. Wood & Co., Philadelphia, low.

175 tons, 6 and 8-inch, state hospital, Thiells, N. Y.

136 tons, 8-inch class 150, Burbank, Calif.; National Cast Iron Pipe Co., Birmingham, Ala., low.

120 tons, 6 to 12-inch, Stoneham, Mass.; bids in.

Unstated tonnage, 3520 feet, 6 and 8-inch, water system, Thomasville, Ala.; R. F. C. loans $20,000.

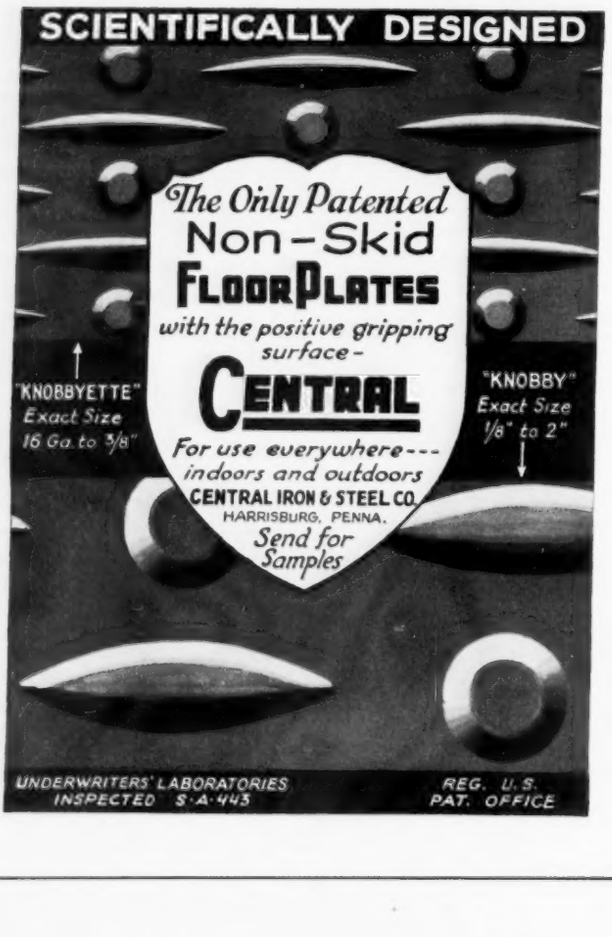
Unstated tonnage, water system, Marion, Ky.; R. F. C. loans $35,000.

Unstated tonnage, 4½ miles of 2 and 8-inch and one-half mile of 1-inch galvanized, Sulligent, Ala.; R. F. C. to loan $38,000.

Unstated tonnage, 17,600 feet of 6 and 8-inch and 5000 feet of 2-inch pipe, Greensburg, Ky.; R. F. C. to loan $40,000. Project includes two steel water tanks.

Unstated tonnage, three miles of 6-inch, water system, Flemingsburg, Ky.; R. F. C. to loan $75,000. Project includes 100,000-gallon steel tank.

Unstated tonnage, 35,000 feet of 4 and 6-inch, water system, Virginia, Ill.; R. F. C. to loan $100,000. Project includes 60,000-gallon steel tank.



Standard Gray Iron Code Winning; Ask Better Prices

(*Concluded from page* 14)

Co., Cleveland, were re-elected respectively to the posts of treasurer and assistant treasurer.

Elected to serve on the board of directors for a 3-year period were: J. D. Coltman, Bullard Co., Bridgeport, Conn.; W. T. Mellow, Liberty Foundry Co., St. Louis; H. P. Spilker, Sterritt-Thomas Foundry Co., Pittsburgh; and A. C. Ziebell, Universal Foundry Co., Oshkosh, Wis.

A. C. Dennison, Fulton Foundry & Machine Co., Cleveland, in a paper "Relation of Uniform Costing to Profits of Individual Members," expressed the opinion that in the main cut-throat prices, discussed so extensively today, are honest prices, obtained by the freak use of the fundamental principles of cost accounting.

He presented several illustrations to show how ignorance of certain cost factors will result in selling the product below the cost of manufacture, and stated the great need of the industry is for a more universal use of

the standards for costing, estimating and pricing.

A paper by P. E. Rentschler, Hamilton Foundry & Machine Co., Hamilton, O., entitled "The Why of Industry Standards," was read by A. E. Grover, cost consultant for the institute. Mr. Rentschler stated that a well-organized cost system is the only means of showing management what product or products are profitable, where wasted capital, material or labor exists, and the individuals responsible for operating profits or losses.

A. C. Ziebell supplied the founder's viewpoint on the specifications for gray iron castings designated as A48-32T. Mr. Ziebell stated that not only was it necessary to raise the standards, as had been done in the new specifications, but it was necessary to prove that the standards are met. By raising the standards a better demand has been created, and consistent performance demands a higher price.

W. W. MacMillen, chairman, iron and steel committee, National Association of Purchasing Agents, reported that on the whole, the specifications have been approved by his committee and will be voted upon at the annual meeting of that group.

A report of the light gray iron subcommittee under the title of "Properties of Gray Iron for Light Structures Analyzed," was presented by Charles Seelbach, Forest City Foundries Co., Cleveland. This committee has undertaken a series of tests using two tensile bars cast ⅞ and ⅜ inches in diameter, three transverse and rigidity bars varying from ⅞ down to 5/16 inches, one machinability test piece (a step bar) representing sections cast from ⅜ to ⅛ inches thick, and one damping test piece to study the ability of light gray iron to absorb vibration.

The report states that experiments on the efficiency of gray iron in damping vibration, regardless of weight, indicate that it is 12 times as great as steel and 20 times as great as aluminum. The committee has developed a drill test which has possibilities as a control test.

Discussion following this paper considered the damping characteristics of gray iron. It was stated that the size of the graphite particles influences the damping properties greatly, and that large graphite flakes absorb vibration, while a lower carbon iron with smaller flakes has more of a tendency to carry vibration along.

Arthur J. Tuscany, manager of the institute, expressed the opinion that the damping tests are developing information of real value, both engineering and sales.

W. N. Bayless, Bayless-Kerr Co., Cleveland, stressed the necessity for co-operation in any merchandising project. He stated that the organization should have specifications, which already have been adopted, standards which would come through a certification plan, and publicity.

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Strip

Orders Improve Slightly but Automotive Users Hold Back—Third Quarter Price Sought

STRIP PRICES, PAGE 45

Pittsburgh—Strip orders improved last week from miscellaneous customers but did not include important automotive buying aside from Chrysler Corp. tonnage. Numerous strip buyers are asking contract coverage on their needs through third quarter but are being quoted only through the second quarter. Nearly all customers of one strip mill here have returned signed second quarter contracts without comment. Several inquiries are current here for cooperage hoop, bands and other sizes and tempers of plain and galvanized strip steel for barrels. Hot-rolled strip is firmly quoted 1.45c, base, Pittsburgh, but wide irregularities feature the cold strip market, nominally at 1.90c, Pittsburgh. The smaller buyer is paying 2.00c for cold strip but deep concessions are reported for larger buyers. One producer here started two mills March 22 and a third mill March 23 on a small order backlog.

Boston—Cold-rolled strip is firm at 2.10c, Worcester, Mass., in New England, with practically no shading. Buying is being resumed slowly, but with little covering for second quarter.

New York—Spot tonnages of cold-rolled strip continue to bring out some concessions under 1.90c, Pittsburgh; however, the latter price continues to represent the minimum at which second quarter contracts are being quoted. Hot-rolled strip appears steady at 1.45c, Pittsburgh, with slightly better second quarter contracting.

Philadelphia—Little activity is noted in strip, with consumers contracting slowly on second quarter commitments. Cold-rolled continues at 1.90c to 2.00c, Pittsburgh, or 2.21c to 2.31c, delivered. Hot strip is unchanged at 1.45c, Pittsburgh, or 1.76c, delivered.

Cleveland—New automotive strip specifications are slower, following the release of tonnage held up during the bank moratorium. Additional orders are expected to develop shortly. Demand from other consumers is quiet. Some protections have been given on requirements for second quarter. Cold-rolled strip holds at 1.80c to 2.00c, base, Cleveland, for spot delivery, and some makers have refused to book second quarter business at less than 2.00c. Hot-rolled strip is 1.45c, base, Pittsburgh.

Chicago—While strip demand has improved little, the tendency is upward and prices are moderately firmer. Contracting is more active and although buyers are less concerned than recently over future price protection, some new business is being closed. Some automotive and miscellaneous tonnage has been released while mill operations generally are unchanged at around 10 per cent. Hot-rolled strip continues 1.55c on current and second quarter business, with cold-rolled strip usually quoted 1.90c to 2.00c, Pittsburgh-Cleveland.

Operating Rate of the Steel Industry, by Weeks

All figures except the monthly open-hearth and bessemer ingot totals of American Iron and Steel institute are percentages. Estimates are based upon weekly reports from the Pittsburgh, Chicago, Youngstown, eastern Pennsylvania, Cleveland, Birmingham, Ala., and Buffalo districts, which are weighted. Weeks end Saturday.

1932	1st Week	2nd Week	3rd Week	4th Week	5th Week	Steel's Average	Institute's Monthly Total tons	Institute's Monthly Average
Jan.....	22	25	26	27	28.5	25.7	1,459,450	25.9
Feb.....	28.5	27	25	25	....	26.4	1,457,710	26.9
March....	25	25.5	24.5	23	....	24.5	1,409,054	24.1
April.....	23	22	22	23	24	22.8	1,238,250	22.0
May.....	24	24	25.5	23	....	24.1	1,106,030	19.7
June.....	21	17	17	17	....	18.0	897,275	15.9
July.....	14.5	12	15.5	16.5	16.5	15.0	792,533	14.6
Aug.....	14.5	14.5	15.5	14.5	....	14.7	832,402	14.2
Sept.....	13.5	15.5	15	17	....	15.3	975,061	17.3
Oct.....	18	19	19.5	19.5	19.5	19.1	1,068,550	19.0
Nov.....	21	21	19	17.5	....	19.6	1,014,794	18.0
Dec.....	16	15	14	12	13	14.0	844,618	15.0
1933								
Jan.....	15.5	17	18	19	....	17.4	1,006,297	17.7
Feb.....	19	19	19	17	....	18.5	1,065,080	20.39
March....	15	13.5	15	14	....	....	.....	....

Operating Rate Off Point to 14; Cleveland, Buffalo Up

Pittsburgh—Steel operations took an unexpected reversal last week and instead of advancing to an anticipated 15 per cent, closed the week with an average of 12-13. A leading interest here experienced, along with others, a marked decline in orders for immediate rolling. Flood stages in the Ohio river suspended operations in at least three river steel plants, one being Carnegie Steel Co.'s Mingo Junction, O., works. An independent mill has resumed after being closed over a week. While 8 out of 53 steelworks blast furnaces continue in blast here, the outlook is not encouraging. Demands of open-hearth departments have been insufficient the past week to maintain even this rate. For this week steel ingot operations may improve, but not more than a point.

Philadelphia—Steelmaking operations are fractionally lower at about 11 per cent, but with steelmakers anticipating a modest upward trend over the next few weeks.

Buffalo—Operations will continue unchanged at 14 per cent this week. Five furnaces are scheduled to continue to produce ingots. An upward revision is indicated early in April.

Youngstown, O.—Steel output here sagged two points last week to 13 per cent, and was expected to hold there this week. Fifteen out of 83 open-hearth furnaces are active; also three steelworks blast furnaces.

Cleveland—Steel ingot production here for the week ended March 25 was at 29 per cent, up from 19 per cent in the week preceding. The rate was increased by the lighting of four open hearths by the Otis Steel Co. Corrigan, McKinney Steel Co. and American Steel & Wire Co. continued with three each. A further gain may develop this week.

Chicago—Ingot production continued for the third week at about 12 per cent. With releases and orders slightly more active, this rate is expected to be increased soon. Blast furnace schedules are at a new low level as a result of the blowing out of one of two stacks of the Inland Steel Co. recently in operation. This leaves five of the district's 36 steelworks furnaces active.

Birmingham, Ala.—While better feeling is noted, no warrant for greater production is reported and the steel estimate is unchanged at 15 per cent.

Pig Iron

Philadelphia Covers Ahead at Rising Price—Bookings Gain More Than Shipments

PIG IRON PRICES, PAGE 46

Pittsburgh—As the business of radiator manufacturers draws to a seasonal close, a further pig iron outlet is diminishing. More than five normally important steel foundries are closed, and iron foundries show no forward interest. An exception is one basic buyer who inquired admittedly from curiosity. Merchant furnaces in this and Valley districts are not operating, and shipments are made from furnace stocks.

Boston—Inquiry for pig iron shows slight gains, but buying is light. Prices are unchanged, with the New England foundry holding to $16, furnace.

New York—A modest improvement in both buying and inquiry is noted in pig iron, with sellers expecting no marked activity for the present. Sales are estimated at close to 2000 tons, orders ranging largely from 50 to 150 tons. An exception is 300 to 500 tons of high silicon iron for a New Britain, Conn., consumer for delivery into third quarter. This business is reported to have gone to the Dutch producer. Prices are stronger, but unchanged at $14, furnace, for Buffalo foundry iron and $12.50 to $13, base, furnace, for eastern Pennsylvania iron.

Philadelphia—Pig iron buying has increased. One domestic seller reports sales of the last fortnight the best in over nine months. Inquiry shows further gain and includes one lot of 5000 tons of foundry iron. Much, however, appears speculative and sellers discourage such buying. Some business has been booked for delivery into third quarter at prices 50 cents to $1 a ton higher than quotations on spot and second quarter.

Buffalo—Demand for pig iron has quieted down, due more to general partial covering for second quarter than to diminished interest. Shipments of castings have dropped off on account of the Detroit banking situation. One furnace continues active. The district base of $16 is firm.

Cleveland—Blast furnace interests here booked for second quarter at least 7000 tons of pig iron during the week, following the 5000 tons reported in the week preceding, since the revival of interest in the market. Most of the inquiries have been closed, and not more than 2000 tons is pending. Shipments to March 20 were reduced sharply from those of February, but for the last ten days of March will be substantially better than in the comparable period last month. Automotive requirements for second quarter lead in recent bookings. Makers note a dearth of railroad orders. Brewery equipment manufacturers have placed small spot lots. The market for local delivery is $15, base, furnace; and for outside shipment generally $13.50 to $14.

Cincinnati—Although long-vision sentiment for an upturn has not changed, activity of the previous week in pig iron has moderated, and new business was held to a few orders for a total under 1000 tons. An inquiry for 1200 tons is pending on northern foundry iron.

Chicago—While pig iron shipments have yet to show improvement comparable with that in orders and inquiries, the market continues active as consumers place future requirements. Bookings this month far outrun those of February, while purchases recently from some interests have been the heaviest in two years. Consumption and shipments are expected to increase slowly, the resumption of automotive operations being a favorable factor. Occasional gains are noted at small foundries, although all losses sustained two weeks ago have yet to be recovered. While an immediate increase in prices is not in prospect, the market has assumed a steadier tone, with $15.50, furnace, for No. 2 foundry and malleable generally firm.

St. Louis—Pig iron inquiry is brisker, some demands being for round tonnages, but actual sales range from carloads to 100 tons for prompt shipment. Farm implement manufacturers note increased sales, indicating heavier future requirements. Blast furnace interests are advising buyers to cover.

Birmingham, Ala.—The little impetus in pig iron selling noted the past week continues. Prices are steady.

Toronto, Ont.—Pig iron sales continue to taper with awards for the week down to around 200 tons, made up of single carlot orders. No buying is being done for future delivery.

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Scrap

Prices Show Strength in Face Of Buying Restraint—Supply Short in Most Grades

Pittsburgh—A flare-up in the market in which over $10 was paid last week for No. 1 heavy melting steel is not in accord with other going prices at the same time. The sale at over $10 was on guaranteed railroad scrap, which usually brings a 50-cent differential, but the selling price seems to involve an understood broker's premium. The market is not clearly defined, due to the ease with which brokers are covering a recent $8.75 order at some 25 cents a ton less than a week ago and the fact that willingness is evident on the part of the scrap trade to sell in the immediate Pittsburgh district at around $8.75. The Steubenville, O., buyer has placed an order for 2500 tons of No. 1 steel at above $9 and a tonnage to the Donora, Pa., melter

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL			
Birmingham	6.50	to	7.00
Boston, dealers	3.50	to	3.75
Buffalo, No. 1	**7.00**	**to**	**7.25**
Buffalo, No. 2	**6.00**	**to**	**6.25**
Chicago	5.00	to	5.50
Cleve., No. 1	7.00	to	7.50
Cleve., No. 2	6.00	to	6.50
Det., No. 1 deal.	4.50	to	5.00
Det., No. 2 deal.	**3.75**	**to**	**4.25**
E. Pa. del. mill			6.50
E. Pa., No. 2 del.	**5.00**	**to**	**5.50**
Federal, Ill.	4.75	to	5.25
Granite City, Ill.	4.50	to	5.00
N. Y., deal. R. R.			5.00
N. Y. deal. No. 2			**3.50**
N. Y. deal. yd.	2.50	to	3.00
Pitts. No. 1	8.75	to	9.25
St. L. No. 1 sel.	5.50	to	6.00
Valleys, No. 1	9.00	to	9.50

COMPRESSED SHEETS			
Buffalo, dealers	6.00	to	6.25
Chi. (Factory)	4.00	to	4.50
Cleveland	6.50	to	7.00
Detroit, dealers	4.25	to	4.75
E. Pa. new mat.	**5.00**	**to**	**6.00**
Pittsburgh	8.50	to	9.00
Valleys	8.50	to	9.00

BUNDLED SHEETS			
Buffalo	4.00	to	4.50
Cincinnati, del.	4.25	to	4.75
Cleveland	4.50	to	5.00
Eastern, Pa.			5.00
Pittsburgh	7.50	to	8.00
St. Louis	1.50	to	2.00

SHEET CLIPPINGS LOOSE			
Chicago	2.00	to	2.50
Cincinnati,	1.75	to	2.25
Detroit, dealers	1.25	to	1.75
St. Louis	1.50	to	2.00

STEEL RAILS SHORT			
Birmingham	6.50	to	7.00
Boston, dealers	3.25	to	3.50
Buffalo	**9.50**	**to**	**10.00**
Chicago (3 ft.)	8.00	to	8.50
Chicago (2 ft.)	8.50	to	9.00
Cincinnati, del.	**8.50**	**to**	**9.00**
Detroit, deal.	**8.00**	**to**	**8.50**
Pitts. (open-hearth, 3 ft. and less)	10.00	to	10.50
St. Louis	7.00	to	7.50

STOVE PLATE			
Birmingham	5.50	to	6.00
Boston, dealers	**2.00**	**to**	**2.50**
Buffalo	**7.00**	**to**	**7.25**
Chicago, net	5.00	to	5.50
Cinci., deal. net	3.50	to	4.00
Det., net deal.	2.50	to	3.00
Eastern Pa.	**5.50**	**to**	**6.00**
N. Y., deal. mill	2.50	to	3.00
St. Louis	5.50	to	6.00

COUPLERS, SPRINGS			
Buffalo	8.50	to	9.00
Chicago	7.00	to	7.50
Eastern Pa.	8.00	to	8.50
Pittsburgh	**9.75**	**to**	**10.25**
St. Louis	5.25	to	6.25

ANGLE BARS—STEEL			
Chicago	7.00	to	7.50
St. Louis	5.75	to	6.25

LOW PHOSPHORUS			
Buffalo, billets and bloom crops	8.50	to	9.00
Cleveland bil. and bloom crops	10.00	to	11.00
Eastern Pa.			**10.00**
Pittsburgh billet bloom crops	**10.75**	**to**	**11.25**
Pitts., sheet bar crops	**10.75**	**to**	**11.25**

FROGS, SWITCHES			
Chicago	5.00	to	5.50
St. Louis	5.00	to	5.50

SHOVELING STEEL			
Chicago	5.00	to	5.50
Cleveland	5.75	to	6.00
St. Louis	4.75	to	5.25

RAILROAD WROUGHT			
Birmingham	5.00	to	6.00
Boston, dealers	1.00	to	1.50
Buffalo, No. 1	**4.25**	**to**	**4.75**
Buffalo, No. 2	**7.00**	**to**	**7.25**
Chi., No. 1, net	4.50	to	5.00
Chicago, No. 2	5.00	to	5.50
Cinci., No. 2	5.25	to	5.75
Eastern Pa.	6.50	to	7.50
N. Y., No. 1, deal.	**2.50**	**to**	**3.00**
Pitts., No. 1	**8.50**	**to**	**9.00**
St. Louis, No. 1	3.50	to	4.00
St. Louis, No. 2	**5.00**	**to**	**5.50**

SPECIFICATION PIPE			
Boston	3.00	to	4.00
Eastern Pa.	**6.00**	**to**	**7.00**
N. Y., deal	2.00	to	2.25
St. Louis	4.75	to	5.25

BUSHELING			
Buffalo, No. 1	**6.00**	**to**	**6.25**
Chicago, No. 1	4.00	to	4.50
Cinci., No. 1 deal.	4.25	to	4.75
Cinci., No. 2	2.50	to	3.00
Cleve., No. 2	**4.00**	**to**	**4.50**
Det., No. 1 new deal.	3.50	to	4.00
St. L., No. 1	3.00	to	3.50
Val. new No. 1	8.50	to	9.00

MACHINE TURNINGS			
Birmingham	2.50	to	3.00
Boston, dealers	0.75	to	1.00
Buffalo	**3.75**	**to**	**4.25**
Chicago	**3.25**	**to**	**3.75**
Cinci., deal	3.00	to	3.50
Cleveland	**4.00**	**to**	**4.25**
Detroit	2.50	to	3.00
Eastern Pa.	3.50	to	4.00
N. Y., deal.	1.35	to	1.50
Pittsburgh	6.50	to	7.00
St. Louis	1.50	to	2.00
Valleys	6.75	to	7.25

BORINGS AND TURNINGS			
For Blast Furnace Use			
Boston, dealers	0.75	to	0.90
Buffalo	**3.00**	**to**	**3.50**
Cinci., deal	3.00	to	3.50
Cleveland	4.50	to	5.00
Detroit, deal.	3.00	to	3.50
Eastern Pa.	3.50	to	3.75
N. Y., deal.	1.35	to	1.50
Pittsburgh	**5.50**	**to**	**6.00**

CAST IRON BORINGS			
Birming., chem.	**8.50**	**to**	**9.50**
Birming., plain	2.50	to	3.00
Boston, chem.	5.50	to	6.00
Boston, dealers	1.00	to	1.25
Buffalo	**3.50**	**to**	**4.00**
Chicago	3.50	to	4.00
Cinci., deal.	3.00	to	3.50
Cleveland	4.50	to	5.00
Detroit, deal.	3.00	to	3.50
Eastern Pa.	3.50	to	3.75
E. Pa., chem.	**8.00**	**to**	**10.00**
N. Y., deal.	1.00	to	1.50
Pittsburgh	**5.50**	**to**	**6.00**
St. Louis	2.00	to	2.50

PIPE AND FLUES			
Cinci., deal.	3.25	to	3.50

RAILROAD GRATE BARS			
Buffalo	4.00	to	4.50
Chicago, net	5.00	to	5.50
Cincinnati	4.25	to	4.75
Eastern Pa.	5.50	to	6.00
N. Y., deal.	3.50	to	4.00
St. Louis	4.50	to	5.00

FORGE FLASHINGS			
Boston, dealers	2.00	to	2.50
Buffalo	5.50	to	6.00
Cleve. ov. 10 in.	6.00	to	6.50
Detroit	2.75	to	3.25

FORGE SCRAP			
Boston, dealers	1.75	to	2.00
Chicago	6.50	to	7.00
Eastern Pa., del.	5.00	to	5.50

ARCH BARS, TRANSOMS			
Chicago, net	5.00	to	5.50
St. Louis	3.50	to	4.00

AXLE TURNINGS			
Boston, deal.	2.50	to	3.00
Buffalo	6.00	to	6.25
Chi., elec. fce.	4.50	to	5.00
Cleveland	5.50	to	6.00
Eastern Pa., del.	**6.00**	**to**	**7.00**
Pittsburgh, O. H.	7.00	to	7.50
St. Louis	3.00	to	3.50

STEEL CAR AXLES			
Birmingham	9.00	to	9.50
Boston, ship. pt.	**5.50**	**to**	**6.50**
Buffalo	10.00	to	10.50
Chicago, net	9.00	to	9.50
Eastern Pa.			14.50
St. Louis	8.75	to	9.25

SHAFTING			
Boston, ship pt.	6.50	to	7.00
Eastern Pa.	11.00	to	12.00
N. Y., deal.	5.50	to	6.00
St. Louis	7.50	to	8.00

CAR WHEELS			
Birming., iron	6.50	to	7.00
Boston, iron deal.	3.00	to	3.25
Buffalo, iron	7.00	to	8.00
Buffalo, steel	8.50	to	9.00
Chicago, iron	8.25	to	8.75
Chi., rolled steel	7.50	to	8.00
Cincinnati iron	**6.25**	**to**	**6.75**
E. Pa. iron			**8.50**
E. Pa. steel	8.00	to	8.50
Pitts., Iron	**7.75**	**to**	**8.25**
Pitts., steel	**9.25**	**to**	**9.75**
St. Louis, iron	4.75	to	5.25
St. Louis, steel	6.00	to	6.50

NO. 1 CAST SCRAP			
Birmingham	6.50	to	7.00
Boston, No. 2	2.00	to	2.25
Boston, textile	6.25	to	6.50
Buffalo, cupola	**9.00**	**to**	**9.25**
Buffalo (mach.)	9.50	to	10.00
Chicago, agri., net	5.25	to	5.75
Chi., mach. net	6.25	to	6.75
Chi., railroad net	5.75	to	6.25
Cinci., mach. cup	6.50	to	7.00
Cleve. cupola	7.00	to	8.00
Det., net deal.	6.50	to	7.00
E. Pa. cupola	9.00	to	9.50
N. Y., cup. deal.	4.50	to	5.00
N. Y., del. local foundries	7.00	to	7.50
Pitts., cupola	9.00	to	9.50
San Fran., del.	13.50	to	14.00
Seattle	4.50	to	6.50
St. L. No. 1 mach.	**6.00**	**to**	**6.50**
St. L. No. 1	5.50	to	6.00

HEAVY CAST			
Boston, del.	3.25	to	3.50
Bost., mach. cast	7.00	to	7.50
Buffalo, break	**6.50**	**to**	**7.00**
Cleve., break	5.50	to	6.00
Detroit, auto net deal.	7.00	to	7.50
Det. break., deal.	4.00	to	4.50
Eastern Pa.	8.00	to	8.50
N. Y. No. 1, deal.	4.50	to	5.00
N. Y. break, deal.	4.00	to	4.50
Pittsburgh	8.00	to	8.50

MALLEABLE			
Boston, consum.	6.75	to	7.25
Buffalo	8.00	to	8.50
Chicago, agri.	**5.00**	**to**	**5.50**
Chicago, R. R.	6.50	to	7.00
Cinci., agri. del.	6.00	to	6.50
Cinci., R. R., del.	6.50	to	7.00
Cleveland, rail	7.50	to	8.00
Det. auto deal.	5.00	to	5.50
St. Louis	7.00	to	7.50

RAILS FOR ROLLING			
5 feet and over			
Birmingham	7.50	to	8.00
Boston, deal.	5.00	to	5.50
Buffalo	**7.00**	**to**	**7.50**
Chicago	8.00	to	8.50
Eastern Pa.			9.50
New York dealer	3.75	to	4.25
St. Louis	7.00	to	7.50

LOCOMOTIVE TIRES			
Chicago, cut	7.50	to	8.00
St. L., No. 1	5.00	to	5.50

LOW PHOS. PUNCHINGS			
Buffalo	9.00	to	9.50
Chicago	7.50	to	8.00
Eastern Pa.	8.00	to	8.50
Pittsburgh	10.00	to	10.50

has been closed at $9.25 for No. 1 steel. The market may be quoted at a wide range, yet within the immediate Pittsburgh district a narrower quotation at $8.75 to $9.25 is comprehensive. Compressed sheets, however, are definitely stronger at $8.50 to $9, as are machine shop and shoveling steel turnings, now quoted 25 cents up.

Boston—Following an advance in No. 1 heavy melting steel scrap for barge loading other grades are firm, although buying is small. Supplies of several grades at primary sources are small.

New York—Domestic demand for scrap continues light, most activity being on No. 1 and 2 steel for export. Other grades are inactive. Prices are firm at $5, barge, for No. 1 and $3.50 for No. 2.

Scrap loading for Japan includes 3000 tons old rails from New York subways and 2500 tons of cut beams from the old bridge over the Hudson river at Albany, N. Y.

Philadelphia—While less buoyant than a week ago, a strong note of confidence continues in scrap. There are no large domestic orders but volume is increasing. A leading export sale involves 6000 tons of armor scrap, long in storage in this district, for Germany. Buying of No. 1 steel for Japan continues with a boat scheduled to leave this port soon. Prices are unchanged.

Buffalo—Demand for scrap continues quiet, but dealers are not anxious to sell at present nominal quotations.

Cleveland—Firmer prices in absence of buying by melters seem a reflection of conditions in surrounding centers. Some blast furnace grades are moving but open-hearth scrap is quiet. Foundry buying of cast scrap is somewhat better in this district.

Detroit—Advances of 25 cents per tons have been made on borings and turnings and on compressed sheets in this market. Other prices remain strong. The market is less active.

Cincinnati—The market for iron and steel scrap shows an undertone of strength. Some sales have been made at slightly higher prices than last month, but no forward tonnage placed as dealers are wary of being caught short.

Chicago—Consumer interest in scrap has moderated with the calming of fears that commodity price inflation is in immediate prospect. Some inquiry still is being received and a few small orders have been placed but no large tonnage buying is being done. Some small lots of heavy melting steel have been bought by one mill at $5.25, although specifications at this point are less rigid than at others. Cast grades continue strong and there is no surplus. Railroads are not disposed to sell large lots.

St. Louis—A waiting attitude prevails among buyers and sellers of iron and steel scrap. The recent purchase of a round tonnage of steel by an East Side mill at $4.50 per ton represented the lowest figure for that grade within the memory of the scrap trade. As a result of this transaction, dealers reduced their quotation from $4.75 to $5.25 to $4.50 to $5.00 per ton on heavy melting steel, f.o.b. Granite City.

Birmingham, Ala.—A lifeless market prevails, with no change in prices and sufficient supplies for all immediate needs.

Toronto, Ont.—Except for a few special grades trading in iron and steel scrap is stagnant. There is no demand for steel scrap and dealers are carrying big tonnages in yards.

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Warehouse

Sales at Low Mark; Small Orders Increase

New York—No. 10 blue annealed sheets are now 2.75c out of warehouse while No. 24 galvanized sheets are 3.50c, New York city, and 3.75c in northern New Jersey for 10 bundles or less, and 3.50c for larger quantities. There has been a slight gain in small orders.

Boston—Jobbers are putting into effect a new list of mill extras. Sales volume for most warehouses has increased slightly.

Philadelphia — Little improvement is noted in warehouse buying. In the experience of most jobbers, January and February orders were about equal. Prices are unchanged.

Pittsburgh—In outside districts competitive with such warehouse centers as Cleveland, warehouses here selling cold-drawn flats and squares have been required to quote on the same basis as rounds and hexagons, or 2.95c base. The 50-cent differential in flats and squares applies in the immediate Pittsburgh district.

Cleveland—Two large Cleveland banks, in which a number of important manufacturers and contractors have their funds, have not yet reopened on a normal basis and the influence of this is felt in warehouse business. The number of small orders has increased slightly, but no improvement is noted in volume.

Detroit—Warehouse business in iron and steel remains quiet and prices are unchanged, but with automobile production continuing to lift out of the recent extreme cessation the trend in demand should be slightly upward.

Cincinnati—Warehouse business here during the past week was virtually suspended on account of a flood stage of the Ohio river, preventing usual deliveries.

Chicago—Demand continued to improve moderately during the past week although sales have not risen to the level prevailing before the banking interruption.

St. Louis—Normally March is an active month with iron and steel warehouses in this district, but thus far the seasonal increase has not developed, due mainly to effects of the banking disturbance.

Semifinished Steel Prices Are Reaffirmed

Semifinished Prices, Page 46

Practically no billet business is noted in the semifinished steel market, and sheet bars are moving slowly. Wire rods are fairly firm at $35, Pittsburgh. Tin bars are in good demand for tin plate producers who are maintaining fair operations. Billets, sheet bars and slabs are nominally $26, base, Pittsburgh, Youngstown, and Cleveland. Forging billets are $31. These prices are to apply for second quarter.

Warehouse Quotations at Leading Centers, in Cents Per Pound

(All Philadelphia prices subject to quantity differentials except reinforcing and Swedish bars)

STEEL BARS □

Baltimore*	2.35c
Boston††	2.90c
Buffalo	2.95c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Cleveland	2.75c
Detroit	2.85c
Houston	2.40c
Los Ang.	3.30c
New Orleans	**2.50c**
New York‡(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.60c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.00c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS □

Baltimore	2.35c
Boston††	3.10c
Buffalo	3.15c
Chattanooga	3.00c
Chicago	2.75c
Cincinnati	3.00c
Detroit	2.85c
New York‡(d)	3.10c
Philadelphia	2.45c
St. Louis	3.00c
Tulsa	3.25c

REINFORC. BARS □

Baltimore	2.35c-3.00c
Boston	3.10c-3.25c
Buffalo	2.95c
Chattanooga	3.00c
Cincinnati	3.00c
Cleveland	2.10c-2.25c
Detroit	2.85c
Houston	3.00c
Los Ang. cl.	2.10c
New Orleans	**2.75c**
Los Ang., lcl	2.40c
New York	2.65c-3.10c
Phila.	2.62½c
Pittsburgh	2.60c
San Fran. cl.	2.00c
San Fran. lcl	2.40c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES □

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	2.65c
Los Ang.	3.30c
New Orleans	**3.50c**
New York(d)	3.10c
Philadelphia	2.45c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

PLATES □

Baltimore*	2.35c
Boston††	3.00c
Buffalo	3.20c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.30c
New Orleans	**3.50c**
New York(d)	3.30c
Philadelphia	2.45c
Phila. floor	5.10c
Pittsburgh	2.85c
Portland	3.35c
San Fran.	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE □

Baltimore*	2.80c
Boston††	2.90c-3.00c
Buffalo	3.10c-3.25c
Chattanooga	3.44c
Chicago	2.75c-2.90c
Cincinnati	3.05c
Cleveland	3.00c
Detroit	2.90c-3.05c
Houston	3.35c
Los Ang.	3.60c
New Orleans	**3.25c**
New York	2.75c
Portland	4.00c
Phila.*† (e)	**2.70c**
Pitts.**	**2.65-2.90c**
San Fran.	3.50c
Seattle	**3.50c**
St. Louis	3.00c-3.15c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK □

Balt.*†	3.50c
Boston††	3.85c
Buffalo	3.70c
Chattanooga	3.50c
Chicago	**3.30c**
Cincinnati	3.50c
Cleveland	3.25c
Detroit	3.30c
Los Ang.	4.20c
New York	3.25c
Phila.*†(e)	**3.15c**
Pitts.**	3.35c
Portland	4.50c
San Fran.	3.90c
Seattle	**4.25c**
St. Louis	3.70c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS □

Balt.*†	4.00c
Buffalo	4.00c
Boston††	4.05c
Chattanooga	3.95c
Chicago	**3.25c-3.50c**

††Base 15,000 lbs., extras on less.

Cincinnati	**3.55c**
Cleveland	**3.50c**
Detroit	3.50c
Houston	3.57c
Los Ang.	4.50c
New Orleans	**3.95c**
New York	3.50c
Phila.*† (e)	**3.50c**
Pitts.**	3.85c
Portland	5.00c
San Fran.	4.55c
Seattle	**4.75c**
St. Louis	4.00c
St. Paul	4.19c
Tulsa	5.10c

†BANDS □

Baltimore	2.65c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.20c
Chicago	2.95c
Cincinnati	3.20c
Cleveland	3.00c
Det. 3/16-in. & lighter	3.15c
Houston	2.85c
Los Ang.	3.80c
New Orleans	**2.75c**
New York(d)	3.30c
Philadelphia	2.75c
Pittsburgh	2.95c
Portland	3.85c
San Fran.	3.15c
Seattle	3.50c
St. Paul	3.20c
Tulsa	3.45c

†HOOPS □

Baltimore	2.65c
Boston	4.90c
Buffalo	3.95c
Chicago	3.50c
Cincinnati	3.75c
Det. No. 14 & lighter	3.65c
New York	3.30c
Philadelphia	3.00c
Pittsburgh	3.60c
Seattle	5.00c
St. Paul	3.75c

†New extras apply.

COLD FIN. STEEL □

Rounds and Hexagons

Baltimore (c)*	3.48c
Boston	3.60c
Buffalo	3.00c
Chattanooga*	3.65c
Chicago	3.00c
Cincinnati	3.32c
Cleveland	2.95c
Detroit	3.15c
Los Ang. (a)	4.25c
New York(g)	3.54c
Philadelphia	3.35c
Pittsburgh	2.95c
Portland (a)	4.50c
San Fran(d)(f)	5.55c
Seattle (a)	4.50c
St. Paul (a)	3.20c
St. Louis	3.36c
Tulsa	4.65c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted, Philadelphia, Chicago, Cleveland, Detroit.

COLD ROLL. STRIP □

Boston 0.100 in., 500 lb. lots	5.20c
Buffalo	5.25c
Chicago (b)	5.65c
Cincinnati	5.80c
Cleve. (b)	5.55c
Detroit	5.40c
Phila. (c)	4.55c
New York	4.55c

(a) Rounds, hex. only.
(b) Net base straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) Bessemer analysis extras included.
‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.

Pacific Coast

Fair Tonnages Being Placed in Pipe, Plates, Reinforcing Bars —Several Projects Up for Bids Soon—Public Work Still Takes Most—Japan Buys Scrap but Supply Prevents Rise

San Francisco—(*By Air Mail*)—Although general business on the Pacific coast has not yet become normal following the bank holidays, several fair sized tonnages were placed. Among these was 1400 tons of 12 and 16-inch cast iron pipe for San Francisco, booked by the American Cast Iron Pipe Co. Prices in most lines are weak.

Awards of reinforcing bars totaled close to 900 tons. Soule Steel Co. secured 330 tons for a postoffice in San Jose, Calif. W. S. Wetenhall Co. took 120 tons for a balloon hangar at Sunnyside, Calif., and unnamed interests were awarded 115 tons for a bridge in San Diego county, California. Pacific Coast Steel Corp. took 380 tons for the Hoover dam, at 1.31c, f.o.b. Los Angeles.

Plate bookings aggregated over 1500 tons and included 1000 tons for three 500-horsepower boilers for the naval station, San Diego, Calif., placed with R. G. Meyler Corp., and 425 tons of 24 and 30-inch welded pipe for Los Angeles, taken by the Western Pipe & Steel Co. Denver has awarded a contract for supplying 16,000 feet of steel pipe to the Stearns-Rogers Mfg. Co., Denver. Plate prices are weak at 1.85c, c.i.f.

Bids have been taken on 800 tons for a postoffice at San Diego, Calif., on 350 tons for the Bargene apartments, San Francisco, and on 190 tons for a warehouse addition, San Francisco. Bids have been postponed from March 21 to April 8 on 500 tons for a postoffice at Phoenix, Ariz. Wide flange material holds at 2.20c, c.i.f., with standard shapes 2.10c.

In addition to the cast iron pipe tonnage for San Francisco, awards were confined to lots of less than 100 tons. Bids open March 24 for 655 tons of 2 to 8-inch pipe for Oakland, Calif. National Cast Iron Pipe Co. was low bidder on 136 tons for Burbank, Calif. The contract for 197 tons of 12-inch pipe for Red Bluff, Calif., went sheet metal. Bids have been opened on 474 tons for Glendale, Calif., and on 437 tons for San Francisco.

Large Project in Seattle

Seattle—With the financial situation beginning to clear, projected improvements are assuming more definite form. Seattle has set April 12 for receiving the waterfront seawall bids and April 26 for opening tenders for the Diablo powerhouse. These two jobs will total $3,000,000 and require about 500 tons of shapes, 2000 tons of reinforcing, 900 tons of cast iron pipe and 5700 tons of sheet steel piling. Bids will be invited soon for a Seattle pipe line replacement calling for about 6000 tons of plates.

Awards pending include 175 tons of sheet steel piling for a government dike at Nome, Alaska, and 250 tons of plates for a Seattle water tank job on which Puget Sound Machinery Depot, Seattle, is low at $23,550.

Bureau of roads will receive bids March 29 at Portland, Oreg., for a span in Pend Oreille county, Washington, involving 123 tons of shapes and 24 tons of reinforcing. Unnamed interests have been awarded 360 tons of spikes, bolts, rods and angle bars for the Yaquina, Oreg., jetty, Hauser Construction Co., Portland, Oreg., general contractor.

The largest cast iron pipe award of the year, 1800 tons, went to Pacific Water Works Supply Co., Seattle, which will furnish French pipe for a watermain extension from Everett to

(*Please turn to Page* 63)

Steel in Europe

General Conditions Show Gain —Prices on Firmer Base

London—(*By Cable*)—Conditions in the Middlesbrough district show little change. Pig iron consumption is expanding, with some Continental inquiry, and Italy has bought some hematite iron. Steel prices are firm. The Midland trade is dull, some Continental steel now competing. Galvanized sheets and tin plate are slow. The Continent reports trade is slightly more active, especially in plates for Japan, and prices are firmer. French makers are competing keenly in the structural market.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, March 23

Export Prices f.o.b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665	
PIG IRON		£ s d		£ s d
Foundry, 2.50-3.00 Silicon	$10.06	2 18 6	$8.27	1 14 0
Basic bessemer	9.29	2 14 0*	6.57	1 7 0
Hematite, Phos. .03-.05	10.15	2 19 0	.....	.....
SEMIFINISHED STEEL				
Billets	$17.20	5 0 0	$10.22	2 2 0
Wire rods, No. 5 gage	25.80	7 10 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$26.66	7 15 0	$26.77	5 10 0
Merchant bars	1.00c	6 10 0	.52c to .53c	2 7 0 to 2 8 0
Structural shapes	1.14c	7 7 6	47c	2 3 0
Plates, †¼ in. or 5 mm	1.31c	8 10 0	74c	3 7 6
Sheets, black, 24 gage or 0.5 mm.	1.31c	8 10 0	1.18c	5 7 6
Sheets, gal., 24 gage, corr.	1.62c	10 10 0	1.46c	6 12 6
Bands and strips	1.19c	7 15 0	.77c to .80c	3 10 0 to 3 12 6
Plain wire, base	1.35c	8 15 0	1.18c	5 7 6
Galvanized wire, base	1.62c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	1.85c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 2.71	0 15 9	.....	.....

British ferromanganese $68 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d ($43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$10.75	3 2 6†	$ 7.86	200	$ 8.09	290	$16.47	69	
Basic bessemer pig iron	10.15	2 19 0†*	6.68	170	6.14	220	18.02	75.50	
Furnace coke	2.28	0 13 3	4.72	120	3.07	110	4.59	19.25	
Billets	17.20	5 0 0	14.54	370	10.74	385	23.03	96.50	
Standard rails	1.27c	8 5 0	1.25c	697	1.50c	1,150	1.43c	132	
Merchant bars	1.04c	6 15 0	.95c	530	.62c	480	1.19c	110	
Structural shapes	1.35c	8 15 0	.99c	550	.61c	470	1.16c	107.50	
Plates, †¼-in. or 5 mm	1.35c	8 15 0	1.22c	680	.75c	580	1.37c	127	
Sheets, black	1.46c	9 10 0§	1.53c	850‡	.91c	700‡	1.56c	144‡	
Sheets, galv., corr., 24 ga. or 0.5 mm	1.81c	11 15 0	2.39c	1,325	1.87c	1,440	4.00c	370	
Plain wire	1.35c	8 15 0	2.03c	1,130	1.69c	1,300	1.91c	177	
Bands and strips	1.46c	9 10 0	.95c	530	.88c	675	1.37c	127	

*Basic. †British ship-plates, Continental, bridge plates. §24 ga. ‡1 to 3 mm basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) dd. Middlebrough

Nonferrous Mill Products

Base price cents per pound f.o.b. mill except otherwise specified. Copper and brass product prices based on 5.75c, Conn., for copper

SHEETS	
Yellow brass (high)	11.25
Copper, hot rolled	13.87½
Lead sheets, cut, to jobbers	7.00
Zinc sheets (100-lb. base)	**9.00**
TUBES AND PIPES	
Seamless yellow brass (high)	13.50
Seamless copper	12.62½
RODS	
Yellow brass (high, full turning)	8.75
Naval brass	9.87½
ANODES	
Copper, untrimmed	10.75
WIRE	
Yellow brass (high)	11.25

Old Metals

Dealers' buying prices, cents lb.

NO. 1 COMPOSITION RED BRASS	
New York	2.50 to 2.62½
Chicago	2.25 to 2.37½
Cleveland	2.25 to 2.50
St. Louis	2.25
HEAVY YELLOW BRASS	
New York	1.62½ to 1.75
HEAVY COPPER AND WIRE	
New York	3.62½ to 3.87½
Chicago, No. 1	3.00 to 3.25
Cleveland	2.75 to 3.25
St. Louis	2.50
COMPOSITION BRASS BORINGS	
New York	2.25 to 2.50
YELLOW BRASS TUBING	
Cleveland	1.75 to 2.00
LIGHT COPPER	
New York	2.75 to 3.00
Chicago	2.12½ to 2.37½
Cleveland	2.25 to 2.50
St. Louis	2.25
LIGHT BRASS	
Chicago	1.00 to 1.25
Cleveland	1.25 to 1.75
St. Louis	1.25
LEAD	
New York	2.00 to 2.12½
Cleveland	1.75 to 2.00
Chicago	2.00 to 2.25
St. Louis	2.00
ZINC	
New York	1.12½ to 1.25
Cleveland	1.12½ to 1.25
Chicago	1.12½ to 1.37½
St. Louis	1.25
ALUMINUM	
Clippings, new, soft, Cleve.	9.50 to 11.00
Clippings, hard, Cleveland	6.00 to 7.00
Borings, Cleveland	2.50 to 3.25
Mixed cast, Cleveland	4.00 to 4.50
Mixed cast, St. Louis	4.00 to 4.25

Secondary Metals

Brass ingot, 85-5-5-5	5.50
Remelt aluminum No. 12	8.00 to 9.00

Metals

Recession in Prices Rules as Prospects for Inflation Grow Dimmer—Old Metals Ease

New York—Price recessions were the rule in the metal market during the past week. Buying interest was extremely light.

Copper—Electrolytic metal again approached the 5-cent level which obtained for a number of weeks prior to the recent advance which was incited by the prospects for inflation. Realization that no more than mild inflation may be expected in at least the immediate future has resulted in price recessions in many commodities, including the metals. The advance in copper was not accompanied by heavy demand as was the case in lead and the inclination of second-hands to take out a profit brought continued price shading. Custom smelters were offering metal at 5.00c near the close of last week. Lake and casting grades also declined. The large mine producers, however, remained out of the market at the nominal quotation of 6.25c on electrolytic. Brass ingot and old metals eased but the recent higher quotations on brass and copper products continued to rule.

Lead — Demand was extremely light this week, being confined mostly to scattered carlots. Efforts of some smelters to balance sales with ore intake resulted in an aggregate drop in quotations of $7 a ton, thus offsetting the advance on the recent wave of buying. Consumers requirements are well covered for the balance of March and to a large extent for April. Little increase in buying is expected until books are opened for May business April 1.

Zinc—Consumers have shown little or no interest in the market. Prime western metal held fairly steady at 3.15c, East St. Louis, through most of the week but easiness developed late in the period when some sellers cut prices to stimulate possible buying.

Tin — Scarcity of metal for spot delivery has resulted in a premium on spot compared with April but the general level of prices has been lower. Fluctuations in sterling and on the London Metal exchange continued to dictate domestic prices.

Antimony—Only light inquiries were reported. Prices moved fractionally lower.

Aluminum — Prices remained steady but sales were light.

Coke By-Products Steady

New York—Shipment of distillates holds to the recent rate, consumers with contracts ordering sparingly. Prices are firm. Phenol demand is slow. Business in naphthalene is light. Prices are unchanged.

Coke By-Products

	Spot
Per Gallon, Producers' Plants, Tank Lots	
Pure benzol	$0.22
90 per cent benzol	0.22
Toluol	0.30
Solvent naphtha	0.26
Comercial xylol	0.26
Per Pound at Producers' Plants in 250-Pounds Drums	
Phenol	0.153 to 0.173
Per Pound at Producers' Plants	
Naphthalene flakes	4.75 to 5.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Atlantic Seaboard	
Sulphate of ammonia	$1.10

Quicksilver Firm

New York—Quicksilver prices are firm, with small lots $54.50, a virgin flask of 76 pounds, and round lots $1 or less under that level. Demand is steady and in small lots.

Fairbanks, Morse & Co., Chicago, net loss after charges in 1932 was $2,547,231, against $5,168,054 in 1931.

Nonferrous Metal Prices of the Week, Cents a Pound

Spot unless otherwise specified

	Copper			Straits Tin		Lead	Lead	Zinc	Aluminum	Antimony	Ingot
	Electro., del. Conn.	Lake, del. Midwest	Casting, refinery	New York Spot	New York Futures	N. Y.	East St. L.	St. L.	98-99%	Spot, N. Y.	Nickel
March 18	5.50	5.87½	5.25	24.35	24.60	3.35	3.22½	3.15	22.90	5.87½	35.00
March 20	5.25	5.62½	5.00	24.00	24.25	3.35	3.22½	3.15	22.90	5.87½	35.00
March 21	5.25	5.37½	5.00	23.90	24.15	3.25	3.12½	3.15	22.90	5.87½	35.00
March 22	5.25	5.37½	5.00	23.90	24.12½	3.10	2.97½	3.15	22.90	5.87½	35.00
March 23	5.12½	5.37½	4.87½	24.20	24.12½	3.00	2.87½	3.10	22.90	5.87½	35.00
March 24	5.00	5.37½	4.75	24.50	24.60	3.00	2.87½	3.05	29.90	5.37½	35.00

Equipment

Improved Sentiment Fails To Produce New Business

Chicago—Sales of machine tools and plant equipment have yet to show a definite pick-up following extreme quietness during the past several weeks. Inquiry shows occasional gains but is insufficient to indicate a marked change in attitude of buyers, orders generally representing urgent requirements.

Northern Pacific railroad is inquiring for a 38-inch planer, while equipment for the new Cincinnati terminal has been placed. Used tools were bought by the latter. Activity in track welding equipment continues light, although some improvement in demand had been anticipated with the approach of the active track work season. Some miscellaneous equipment for breweries is being placed, with the total of such work small.

Nordberg Mfg. Co., Milwaukee, reports closing a contract with the Homestake Mining Co., Lead, S. D., for two double conical, drum geared, motor driven hoists, one for hoisting ore and the other men and supplies. The first is to be delivered next fall and the second early in 1934. Designing already is under way.

A sheet maker in the Chicago district has been inquiring for a sheet normalizer, with closing reported imminent.

Pittsburgh—Interest in steel mill equipment has receded following a slight flurry of inquiries and orders about two weeks ago. An imposing volume of pending work is still on equipment makers' books but awaits appropriation and release from the buyer. Refractory brick buying has been slower and ingot mold makers report demand for their product is the slowest in many months.

New York—While sentiment has improved, inquiry and buying of machinery and plant equipment drags, showing little gain. Eastern navy yards continue to buy machines for yard shops and ships, a small list closing this week. General industrial demand is small. A Russian delegation recently took bids on a list of aircraft plant equipment, but has left without definitely placing any business here.

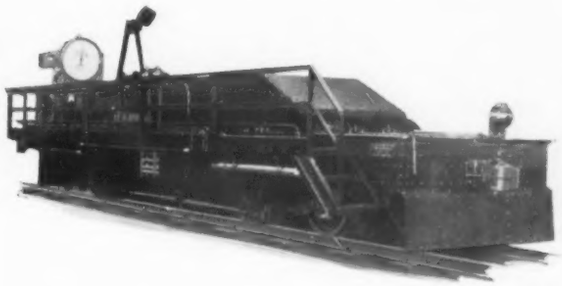
Worcester, Mass.—Inquiry for machine tools is light and buying is limited to a few individual units. One district maker of steel mill equipment has done some moderate part business, but in general, New England machinery builders have little business booked and shops are still on curtailed operating schedules.

Cleveland—After a slight flurry attendant with reopening of banks, inquiry and sales of machinery and plant equipment have slumped off once more and at present are practically stagnant. A small volume of replacement parts constitutes about the only active feature of the market.

Builders of brewery equipment have yet to order machinery in any substantial amount, although this field has good possibilities.

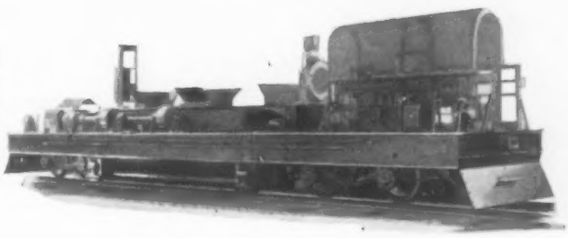
Tuthill Spring Co., 760 Polk street, Chicago, has appointed the following distributors for the company's highway guard: Lester Knight Jr., 223 North Whasatch avenue, Colorado Springs, Colo.; Paul Tholl, Sparks, Nev.; J. D. Evans Equipment Co., Rapid City, S. Dak.; J. V. Mullen, Parkersburg, W. Va.; D. H. Beckwith, Shorewood Hills, Madison, Wis.

ATLAS SCALE CARS



Double Compartment Bottom Dump Scale Car. Scale of All Steel construction equipped with Atlas Indicating Dial and Recorder.

20 Ton Capacity Double Compartment Scale Car. Orr type Bin gates controlled from operator's station on scale car.



Other Atlas Products

Gas-Electric and Diesel-Electric Locomotives—Car Pushers—Storage Battery Locomotives—Electrically Operated Industrial Cars—Scale Cars and Weighing Cars of all kinds — Ore Transfer Cars and Blast Furnace Charging Cars.

Coke Oven Equipment

Pushers and Levelers—Coal Charging Cars—Door Handling Machines — Coke Quenching Cars.

Also Atlas Patented Indicating and Recording Mechanism for Weighing Scales.

THE ATLAS CAR & MFG. CO.

Engineers *Manufacturers*

CLEVELAND, OHIO

Here and There in Industry

NATIONAL ACME CO., Cleveland, manufacturer of automatic screw machines, screw machine products and automotive parts, is moving the equipment of its plant at Windsor, Vt., to Cleveland, where all manufacturing will be concentrated. The Windsor plant was devoted to the production of automatic screw and chucking machines, under Acme and Gridley trademarks. C. W. Simpson, manager at Windsor, will be transferred to Cleveland and join the executive staff. "Key" men also will be transferred to aid in overseeing the new plant operations. The move places the company's production in the center of its raw material supply and also its distribution area and other economies result. National Acme started business at Hartford, Conn., in 1897 and moved to Cleveland a few years later. The plant at Windsor, Vt., was started in 1914. Its product is in use widely over the United States and in automotive plants abroad. F. H. Chapin is president.

□ □ □

Scovill Mfg. Co., Waterbury, Conn., has been licensed by the Dardelet Threadlock Corp., New York, to manufacture bolts and nuts with the Dardelet self-locking thread.

□ □ □

Morse Chain Co., Ithaca, N. Y., has appointed the E. W. Buschman Co., 626 Broadway, Cincinnati, district distributor for a line of power transmission chains, silent and roller types.

□ □ □

Jos. Greenspon's Son Pipe Corp., St. Louis, Louis Greenspon president, has been organized by Jos. Greenspon's Son Iron & Steel Co. to operate a jobbing subsidiary of the latter company.

□ □ □

Dana Kepner, manager of the Denver office of the Pacific States Cast Iron Pipe Co., 1624 Adams street, Denver, is now also representing several other manufacturers of waterworks equipment.

□ □ □

George W. Prentiss & Co., Holyoke, Mass., has taken over and has combined with its main plant the machinery and equipment of the National-Harris Wire Co., Newark, N. J., and has created a department for the manufacture of alloy wires in a wide variety, for radio tubes, resistance and other uses.

□ □ □

Hedges-Walsh-Weidner Co., Chattanooga, Tenn., will build 24 boilers for use on naval destroyers, to cost about $270,000. The boilers will be of high strength materials for pressures of 400 pounds, fired by oil.

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Hydro-Ash Corp., 115 South Dearborn street, Chicago, manufacturer of ash-sluicing systems, has elected James Stokoe president, Ernest E. Lee vice president, George W. Hansen secretary, and John L. Higgins treasurer.

□ □ □

Patterson Foundry & Machine Co., stoker division, East Liverpool, O., has appointed the Skeldon Engineering Co., Toledo, O., its district representative for Toledo territory for its commercial and industrial stokers, ash conveyors, ash storage tanks and soot blowers.

□ □ □

Metal Products Co., Oklahoma City, Okla., has been organized as a manufacturing subsidiary of the Wylie-Stewart Machinery Co., distributor of roadbuilding and highway construction machinery. J. S. Wylie is chairman of the board and H. E. Stewart is general manager.

□ □ □

Manning, Maxwell & Moore Inc., distributor of mill, mine, railroad, machinists' and contractors' supplies, and affiliated companies, the Consolidated Ashcroft Hancock Co. and the Shaw-Box Crane & Hoist Co. Inc., have leased the sixty-fifth floor of the Chrysler building, New York. Present headquarters are in the Pershing Square building.

□ □ □

Rudy Furnace Co., Dowagiac, Mich., manufacturer of warm air furnaces, has bought the Betts & Cole Heater Co., Marshall, Mich., manufacturer of hot water tank heaters and incinerators. Equipment and stock will be moved to Dowagiac and the Marshall plant will be abandoned. Everett D. Betts, of the Betts & Cole company, will become a member of the Rudy organization.

□ □ □

Square D Co., Detroit, has elected F. W. Magin, formerly executive vice president, as president. T. J. Kauffman has been elected chairman of the board and H. S. Morgan secretary and treasurer. J. H. Pengilly, Los Angeles; L. W. Mercer, Vernon Brown and Carlton M. Higbie were elected vice presidents. Mr. Magin formerly was active head of the industrial controller division at Milwaukee.

□ □ □

Lancashire Dynamo & Crypto of Canada Ltd., Bruce Peebles of Canada Ltd., Harland Engineering Co. of Canada Ltd. and Crompton Parkinson of Canada Ltd., each a subsidiary of a British engineering firm, have been merged as of April 1 under the name of United Electrical Engineers Ltd., with head office in Toronto, Ont., C. G. Abbey is president, Brian M. Burt vice president and Ontario manager, and S. E. Gladwell secretary and treasurer.

□ □ □

American Cyanimid & Chemical Corp., 535 Fifth avenue, New York, has secured exclusive sales rights on all ores and pigments mined from the mabelite deposit controlled by the Eastern Mabelite Corp., 225 Mercer street, New York. This line is an addition to an extensive list of chemicals and raw materials carried by this corporation for the paint and protective coating industry. Mabelite pigment contains a peculiar conglomeration of ferric oxide, silica and alumina, which, it is said, makes it particular effective as a protective coating.

□ □ □

Chain Belt Co., Milwaukee, has appointed the Ray Corson-Elkins Co., Denver, to handle its complete line of construction equipment in Colorado and several counties in Wyoming. The company was formed recently by Ray Corson, for 14 years connected with the machinery trade in Denver, and Thomas Elkins, formerly with the Colorado state highway department. Chain Belt Co. has also appointed the R. L. Harrison Co. Inc., Albuquerque, N. Mex., and Keller Tractor & Equipment Co. Inc., 5139 Martin avenue, Detroit, distributor for its construction equipment.

□ □ □

Barber-Colman Co., Rockford, Ill., manufacturer of special doors and equipment, has centered its distribution in Northern Ohio in a branch office at 3030 Euclid avenue, Cleveland. B. R. Krause, located at Buffalo, will cover part of northern Pennsylvania as well as central and western New York. G. M. Mencke, Cincinnati, takes on additional territory in southern Ohio and northeastern Kentucky. The Barber-Colman branch at Minneapolis adds a few counties in southeast South Dakota. The northeast portion of New York will be covered by the Barber-Colman Co. of Massachusetts at Framingham, Mass. John E. Figner Co., 6388 Penn avenue, Pittsburgh, has been appointed distributor for western Pennsylvania, southeast Ohio, all of West Virginia and portions of Kentucky and Maryland.

Honor Thomson, Now 80

Prof. Elihu Thomson, pioneer of the electrical industry and one of the founders of the General Electric Co., will be honored at a public dinner at the Massachusetts Institute of Technology, Cambridge, Mass., on March 29, his eightieth birthday.

BOOKS WORTH READING

(*Concluded from Page 26*)

ing Co. Ltd., Caxton House, Westminster, London.

A monograph of the series by the Engineering Foundation, this volume is designed to collect in readily usable form the important facts on molybdenum steels and other alloys of molybdenum and iron, with or without additional alloying elements. Here has been collected the available information presented in volumes of journals and textbooks in many languages. For those interested in this alloying element the gathering and collating of information thus is done without wasteful duplication of effort and presented in a form easily referred to by the seeker.

More than 800 articles were studied in detail and specially abstracted for the information presented in this volume. These articles are included in the bibliography appended to the text. The greatest care has been used to avoid reproducing early errors by observers, which later investigation has modified. Where discrepancies exist both sets of data are given. In addition to the bibliography, a name index and a subject index are provided.

◆

By-Product Coke Information On International Basis

International Handbook of the By-Product Coke Industry, by Prof. Dr. W. Gluud; cloth, 880 pages, 6 x 9 inches; published by the Chemical Catalog Co. Inc., New York; supplied by STEEL, Cleveland, for $15, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Seeking to present a comprehensive survey of the working methods, scientific principles and technical details of the by-product coke industry as practiced on large scale in all important countries, the author has produced this work, which is in two volumes, one devoted to the scientific and the other to the technical material. His aim is stated as an initial attempt at collecting the subject matter and he hopes corresponding handbooks may be published by the coke interest in other producing countries.

The preparation of Prof. Dr. Gluud's book for American readers has been in charge of D. L. Jacobson, chemical engineer for the Koppers Co., Pittsburgh. The translation into English was by Dr. A. Thau, Berlin.

The first section is devoted largely to the chemistry of coal, its deposits, analyses, destructive distillation of coal and coke production of the world. The second section, much the larger portion, takes up the production of coke in its various phases and the recovery of by-products. Each subject is discussed at great length and in close detail. The volume brings to hand an unusual collection of data which previously had been found only in scattered locations and difficult of access.

◆

Standards on Trial Are Given Final Publication

A. S. T. M. Tentative Standards, 1932, 1236 pages, 6 x 9 inches; published by American Society for Testing Materials, Philadelphia; supplied by STEEL, Cleveland for $8 in cloth and $7 in paper binding, plus 15 cents for postage; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

Tentative standards in effect at the close of 1932 are included in this publication. Though not finally adopted, many of these standards are in wide use pending approval. A total of 226 tentative standards is included, with test methods, definitions of terms and recommended practices, effective as of Oct. 31, 1932. Included are 39 for ferrous metals, 20 for nonferrous metals, 31 for concrete, clay products, gypsum, lime and cement and 24 for coal, coke and similar products.

Among the new specifications herein presented are those for lap-welded and seamless steel and lap-welded iron boiler tubes, riveted steel and wrought iron pipe, electric-fusion welded steel pipe, cast iron culvert pipe, structural rivet steel, structural medium steel and several kinds of galvanized wire and wire products. Specifications are also given for ferrotungsten, low-carbon ferromolybdenum and molybdenum salts and compounds.

Among nonferrous specifications are those for hard-drawn copper transmission cable, copper water tube, aluminum-copper-magnesium-manganese alloy bars, rods and shapes, and magnesium-base alloy sheet and wrought shapes.

Pacific Coast Markets

(*Concluded from Page 59*)

Alderwood Manor, Wash. Contract calls for 36,000 feet of 12-inch and 8000 feet of 16-inch and includes hydrants and accessories. American Cast Iron Pipe Co. will furnish about 80 tons of 6-inch pipe and accessories for Lynden, Wash.

While the jobbing trade remains inactive, sentiment is improving and the fact that prices are being maintained is promising. At Portland, Oreg., foreign materials are based 50 cents lower than the range on domestic.

Despite Japan's willingness to purchase scrap, prices show no disposition to strengthen, due to the quantity of material available. Steamship space is about $2.50 per gross ton. A shipment of scrap rails was recently dispatched from Astoria, Oreg. Practically no scrap is being sold for domestic use.

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New York

BROOKLYN, N. Y. — Porcelain Metals Inc., M. J. Saltzman president, Sedgwick and Van Brunt streets, has plans by H. Ginsberg, 205 East Forty-second street, New York, for a 1-story plant to cost about $30,000 with equipment.

JOHNSON CITY, N. Y.—Binghamton Flexible Shaft Co. plans construction of a plant here to cost about $50,000, to replace its plant recently burned. (Noted March 6).

ROCHESTER, N. Y.—Sidney B. Roby Co., automotive jobber and mill supply distributor, has suffered severe loss by fire.

New Jersey

HIGHBRIDGE, N. J.—Exact Tool & Level Co. has suffered fire damage of about $20,000 to its plant.

HILLSDALE, N. J.—Welding Supply Co. Inc. has been incorporated with $20,000 capital.

NEWARK, N. J.—General Metal Mfg. Co. has been incorporated with $125,000 capital to manufacture metal products, by Jacob Lubetkin, 60 Park place, Newark, N. J.

Pennsylvania

CANONSBURG, PA.—Standard Tin Plate Co. is building a warehouse addition, brick walls and sheet steel roof. About 150 tons of shapes have been awarded to the Ft. Pitt Bridge Co., Pittsburgh, and the galvanized sheets for the roof are on inquiry.

PITTSBURGH—Neville Island Tar Co., Neville Island, plans to repair and install new equipment in its tar mixing plant, to cost about $80,000.

PITTSBURGH—Gulf Refining Co. met severe damage by fire to its refinery on Neville Island, a large gasoline still and other equipment being involved.

Ohio

BETHEL, O.—Reconstruction Finance Corp. loan has been approved for $35,000 for a waterworks plant, including a pumping station, equipment, 100,000-gallon storage tank and distribution system.

CLEVELAND—Master Metals Inc. has been incorporated with 4000 shares no par value, by Charles K. Arter and associates, Terminal Tower, Cleveland.

CLEVELAND—Battery Grid Machine Inc. has been incorporated with $6250 capital and 350 shares no par value, by W. VanHoefen, 801 Marshall building, Cleveland.

TOLEDO, O.—Doehler Die Casting Co., Smead avenue, plans alterations and readjustments in its plant here, to accommodate concentration of manufacturing operations from other plants.

Michigan

DETROIT—Michigan Public Service Co. plans construction of a $15,000 electric power transmission line in the northern part of Muskegon county.

DETROIT—Wayne Screw Products Co., 521 St. Jean street, has been incorporated to manufacture screw machine products, by John J. Corin, 2037 Oakman boulevard, Detroit.

KALAMAZOO, MICH.—Bard Steel & Mill Supply Co., 251 North Edward avenue, has been incorporated with 13,000 shares no par value to deal in steel and mill supplies, by Harry C. Howard, 301 Kalamazoo National Bank building.

MANISTEE, MICH.—Preliminary plans have been completed for a municipal electric light and power plant and engineers will be chosen early in April.

MORENCI, MICH.—Plans are being prepared for a municipal waterworks and electric light plant, including building, generating equipment switchboards, 100,000-gallon steel elevated tank and pumping equipment, to cost about $140,000. Laws, Norris & May, Ann Arbor, Mich., are engineers.

NORTH MUSKEGON, MICH.—Plans have been made by George Clark, city engineer, for a pumping station and filtration plant to cost about $40,000. Boulay & Harrison, Toledo, O., are consulting engineers.

Indiana

ROCKVILLE, IND. — Rockville Sanitarium plans a power plant, including new boilers, to cost about $125,000.

INDIANAPOLIS — Central States Bridge Co., 601 Beecher street, plans to rebuild its shops at a cost of about $40,000.

MADISON, IND.—City council plans to install pumping machinery and auxiliary mechanical equipment in the proposed new municipal water plant. John W. Moore, Knights of Pythias building, Indianapolis, consulting engineer, will make a survey.

Illinois

CHICAGO—Metalcraft Corp., 361 West Superior street, has been incorporated with $20,500 capital to manufacture lamps and similar devices, by Maurice Levine, 127 North Dearborn street.

CHICAGO—Safety Drain Mfg. Corp., 159 North State street, room 1120, has been incorporated with $4000 capital to manufacture plumbing specialties, by Joseph N. Gerrity, 159 North State street.

CHICAGO—S. Gordon & Sons Inc., 41-49 West Cullerton street, has been incorporated with $15,000 capital to deal in steel, iron and nonferrous scrap, by Greenfield & Reiff, 11 South LaSalle street, Chicago.

GIRARD, ILL.—Frost Electric Screen Co. of Illinois, 116 East Mound street, Girard, has been incorporated with $50,000 capital and 40,000 shares no par value, to manufacture electrical insect destroyers, by Samuel C. Smith Jr., Girard.

JOLIET, ILL.—Inland Waterways Boat Co. Inc. has been incorporated with $15,000 capital to operate water craft, by William H. Sumpter, 1256 Bryn Mawr avenue, Chicago.

STREATOR, ILL.—Harold M. Behan, liquidating agent, is offering for sale the real estate, buildings, machinery and equipment of the Metal Stampings Corp., including a large punch-press department, machine and tool shop, spraying booths, dipping equipment and polishing and plating department.

Southern States

CRYSTAL CITY, FLA.—American Potash & Super-Phosphate Corp., Canal Bank building, L. M. Turnbull vice president and general manager, recently organized, plans installation of electrical power equipment and a steam generating plant at its proposed plant here, to cost about $400,000.

CORDELE, GA.—Glover Machine Works plans addition to its plant to cost about $35,000.

NEW ORLEANS—Ole K. Olsen Inc. has been incorporated with 2000 shares no par value to manufacture steel products.

STARKVILLE, MISS.—Plans are being prepared for the city council for a municipal electric light and power plant, with diesel gas engine, to cost about $100,000. Financing is being arranged.

PARKERSBURG, W. VA.—Standard Oil Co. of New Jersey has asked a federal permit to build a pier at its plant on the Little Kanawha river, two miles from its mouth, to permit shipments of its products by river.

Oklahoma

GOWEN, OKLA.—Hartshorne Valley Coal Co. has been incorporated with $10,000 capital to engage in coal mining operations, by Joe C. Davis, Gowen, Okla.

HOLDENVILLE, OKLA.—Crescent Refining Co. has had preliminary plans

prepared by H. H. Pegg, engineer, Allen, Okla., for a cracking plant at its refinery here, to cost about $40,000.

TULSA, OKLA.—Blue Front Welding Co. has established a welding shop at 5 East Archer street, specializing in electric and acetylene welding. P. D. Forsythe and John Pankey are owners.

TULSA, OKLA.—John Vaughn Mfg. Co. has leased a plant at North Madison street and the Frisco railroad for the manufacture of insect sprayers. John Vaughn is president and manager.

Texas

HOUSTON, TEX.—Continental Can Co., 100 East Forty-second street, New York, is having plans made for construction of a 3-story manufacturing plant and warehouse at Canal and Greenwood streets, main building 120 x 160 feet, to cost about $500,000.

LONGVIEW, TEX.—Union Refining Co. plans construction of an oil refinery near Camp's Switch, Tex., with daily capacity of 2500 barrels.

LUBBOCK, TEX.—John W. Moore Construction Co., Lubbock, has been given a contract to build an 8-inch welded gas pipeline from the Lea county gas fields in New Mexico to Lubbock, about 120 miles.

WICHITA FALLS, TEX.—Freeman-Hampton Oil Corp., Hamilton building, plans construction of a refinery near Lueders, Tex, Jones county, and pipelines for gathering oil from leases.

WICHITA FALLS, TEX.—Continental Oil Co., Continental building, Ponca City, Okla., plans expenditure of $30,000 for new furnaces and distillation equipment at its refinery here. D. H. Tyler is plant superintendent and M. E. Clawson, Continental building, Ponca City, Okla., is chief engineer.

Wisconsin

BEAVER DAM, WIS.—Orin Vesper, 112 Gilmore street, has designed a coal spraying device and will soon start production.

BELOIT, WIS.—Beloit Iron Works, manufacturer of papermaking machinery, will start April 1 enlarging its boiler house. The present house will be enlarged to 44 x 48 feet and the roof will be raised from 17 to 30 feet. Contract has been placed for a new 253-horsepower Babcock & Wilcox boiler of the three-drum, bent-tube type, producing 15,000 pounds of steam per hour. Coal bunkers of 200 tons capacity and a chain grate automatic stoker will be installed.

JANESVILLE, WIS. — Janesville Fence & Post Co. has started spring production of barbed and woven wire fencing and also jobbing of steel posts and accessories.

KAUKAUNA, WIS.—Gar-Worth Mfg. Co. has been incorporated with $10,000 capital to manufacture iron, steel and metal specialties, by G. R. Charlesworth and associates, 611 West Wisconsin avenue, Kaukauna, Wis.

MARINETTE, WIS.—Marinette & Menominee Box Co. will start about April 1 on construction of a new plant to cost about $50,000, replacing the one burned in December.

MILWAUKEE—Christian Garschke, 2725 South Austin street, has established a brass and aluminum foundry at 828 South Water street.

MILWAUKEE—Continental Camps Corp. has incorporated to manufacture home, playground and camp furniture and equipment by Ward M. Calhoon, 3314 North Seventeenth street, and associates.

MILWAUKEE—Department of public works will ask bids soon on pumping equipment for a booster station at South Forty-fourth street and National avenue, where a 6,000,000-gallon steel storage tank is being completed. Pumps will cost about $20,000. R. E. Staelting is commissioner of public works.

Minnesota

ALBERT LEA, MINN.—City council has retained Black & Veatch, 405 East Thirteenth street, Kansas City, Mo., consulting engineers, to make a survey and estimate of cost of a municipal electric light and power plant.

TRACY, MINN.—Liquefied Natural Gas Corp., 1209 Foshay tower, Minneapolis, plans a gas plant on a 640-acre site to cost about $60,000, including tanks and mains.

Iowa

BLANCHARD, IOWA—Plans are being made for a municipal electric light and power plant to cost about $40,000, by H. L. Cory Co., 1033 Redich Tower, Omaha, Nebr., engineer.

ROCKFORD, IOWA.—City council has arranged for a fund of $105,000 for a municipal electric light and power plant, plans for which will be completed soon.

Kansas

BURLINGTON, KANS.—City council is considering a report by E. T. Archer & Co., New England building, Kansas City, Mo., on a proposed municipal electric light and power plant to cost $85,000 and distributing system costing $33,000. It is expected bids will be asked soon. (Noted Feb. 6).

ENTERPRISE, KANS.—J. B. Ehrsam & Sons Mfg. Co. plans a new fireproof foundry and a shop for plate and light structural work.

GREAT BEND, KANS.—Henry Dickason and Roy Miller, a partnership, plan to build an oil refinery here, to cost $50,000. The former will be in charge of construction.

WICHITA, KANS.—Western Kansas Refining Co., Henry Rosenthal president, Ellis-Singleton building, is considering construction of an oil refinery near Hollyrood, Ellsworth county, Kans.

Colorado

GREELEY, COLO.—A vote will be taken April 4 on a proposal to build a municipal power and gas plant.

Pacific Coast

BRAWLEY, CALIF.—City council is considering construction of a municipal electric light and power plant, including diesel engine generating units, to cost about $200,000. Estimates have been made by Burns-McDonnell-Smith Engineering Corp., 1031 South Broadway, Los Angeles.

FRESNO, CALIF.—Guy C. Redwine, Fresno, plans to build an ice plant at Hanford, Calif., with diesel engine power and 500 tons storage capacity. Operation is planned for this spring.

HEMET, CALIF.—An election will be held April 4 on a municipal water system to cost about $121,000. Burns-McDonnell-Smith Engineering Corp., Western Pacific building, Los Angeles, is engineer.

PASO ROBLES, CALIF.—Bids will be opened April 3 by Lillian B. Henry, city clerk, for furnishing and installing water pumps with diesel-electric power.

SAN JOSE, CALIF.—Continental Can Co., 155 Montgomery street, San Francisco, has let contract to the Austin Co., 777 East Washington street, Los Angeles, for a 2-story warehouse and equipment at Ninth and Mission streets, to cost about $19,000.

EVERETT, WASH. — Washington Gas & Electric Co., P. Black manager, plans to spend $50,000 in repairs and replacements to equipment in its power plant and distribution system.

SEATTLE—Pump Supply Co. has been incorporated with $10,000 capital to deal in machinery and pumps, by Austin F. Case, attorney, Dexter Horton building, Seattle.

Dominion of Canada

SARNIA, ONT. — St. Clair River Subway Ltd. will ask the government for a charter for an international tunnel under St. Clair river from Sarnia to Port Huron, Mich. C. A. White, 209 North Vidal street, Sarnia, Ont., is interested.

WALKERVILLE, ONT.—Hull Mfg. Co. of Canada Ltd., subsidiary of a Toledo, O., company, has opened a plant here to manufacture automotive equipment.

QUEBEC, QUE.—Arthur Surveyer and R. A. Ross, consulting engineers, Montreal, Que., are preparing a report on the cost of municipalizing the power and electric light supply. Permission to do so has been asked of the government. F. X. Chouinard is city clerk.

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